

























# ANIMAL KEEPERS' FORUM



The Journal of the American  
Association of Zoo Keepers, Inc.

**JULY 1996**

**ANIMAL KEEPERS' FORUM**, 635 S.W. Gage Blvd., Topeka, KS 66606-2066

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Mini-Zoo (Reptiles); Linelle Lone, Denver Zoo (Amphibians)

**Diet Notebook, Mammals, Vol. II** - Susan Bunn Spencer, Rockford, MI

**Incubation Notebook Project** - Scott Tidmus, Sedgewick County Zoo, Wichita, KS

**Exhibit Design Resource Notebook** - Mike Demlong, The Phoenix Zoo, Phoenix, AZ



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## About the Cover.....

*This month's cover features a male American kestrel (*Falco sparverius*) drawn by John Heine, a keeper at the Riverside Zoo in Scottsbluff, NE. Also called the Sparrow Hawk, this hovering falcon is the smallest of the true falcons, measuring 20-28cm and weighing between 100-200g. They are found in about 20 subspecies from Alaska and Newfoundland to Tierra del Fuego. Their main prey is field mice although they also eat other small rodents, locusts, beetles etc. and are very beneficial to man because of their "pest species" diet. They do not build nests but will use the abandoned nests of crows or magpies. They also will lay their 4-6 egg clutch in a hollow tree, a crevice on a rockface, or in niches of manmade structures like barns, old churches, etc. This species, like most raptors, has remarkable eyesight which help make it such a successful hunter. Thanks, John!*

## Information for Contributors

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Articles may be submitted on disk by arrangement with the Editor. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy finish black and white photos **only are accepted**. Color slides should be converted to black and white prints (minimum size 3" x 5" [8cm x 14cm] ) before submission. Clearly marked captions should accompany photos. Please list photo credit on back of photo.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

**Deadline for each regular issue is the 10th of the preceding month.**

**Dedicated issues may have separate deadline dates  
and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the AKF staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by AAZK, Inc.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$3.00 each.

## *From the Executive Director*

The longer that I am involved with this Association, the more I learn that there is one thing that is constant - change. (Well, maybe stress). Members progress up the ladder to management or leave the profession to avoid starving. Board Members come and go, projects and committees are formulated and chairs appointed. Work progresses, we communicate effectively and meet every year to chart progress. Every once and awhile goals are met, work completed and the profession reaps the rewards. We change and we move on.

You may have noticed recent changes have occurred in our Bowling for Rhinos program. This conservation fundraiser is recognized throughout the profession as an unparalleled success. I would like to take a moment to explain the changes that have occurred and to bring the rumors under control.

Anna Merz, the matriarch of the Ngare Sergoi Rhino Sanctuary, has retired. She has left the Sanctuary for a quiet and well-deserved restful life in South Africa. Anna will continue to travel and promote the Sanctuary at every opportunity.

The management of the Sanctuary has been undertaken by the Lewa Wildlife Conservancy (LWC), of which Ian Craig, long a part of Lewa Downs and manager of the Sanctuary, is the director. AAZK, Inc. has pledged to work directly with LWC and form a partnership to oversee application and management of the BFR funds. In addition, as a facet of this partnership, LWC has pledged to create a research station on the grounds of the Sanctuary for AAZK members to have at their disposal. As LWC investigates and seeks to take limited advantage of the ecotourism dollar, as a means of offsetting expenses, it is exciting and comforting that the AAZK membership and our ability to perform research on the grounds of the Sanctuary is of paramount importance to the Directors of LWC.

The partnership mentioned above also includes the Ngare Sergoi Support Group, Inc. In the past, NSSG, Inc., Andy Lodge, Director, has generously supported and absorbed all expenses associated with BFR. In addition to the ties to the BFR program, the partnership of AAZK, LWC and NSSG has recently negotiated a change in focus that will allow NSSG to spend more time in the public sector, soliciting donations on behalf of LWC. NSSG has pledged to forward 80% of all donations received to LWC. This includes monies received by NSSG in association with BFR talks, after fees and expenses. Twenty percent of donations will be retained to offset expenses associated with the operation of NSSG.

Andy Lodge will continue to represent the BFR program for AAZK to the membership and the public through his talks. I have encouraged him to charge a nominal speaker fee and reasonable expenses for these talks, which is only fair. We encourage Chapters to take advantage of this opportunity to learn more about the Lewa Wildlife Conservancy and financially support both LWC and



NSSG and their educational programs. Up to date promotional materials regarding LWC, for use in future BFR events, will be available soon through NSSG and/or AAZK.

In 1990, AAZK pledged to our membership that we would send 100% of all BFR funds realized to Africa in support of the Ngare.Sergoi Rhino Sanctuary. In 1992, in response to membership concern, it was decided that all monies realized over \$100k would be sent to Ujung Kulon in support of the Javan rhino. To date, you have contributed over \$700,000.00 in support of the rhino and 100% of money raised has gone to these fine programs.

But as I stated previously, time usually dictates change.

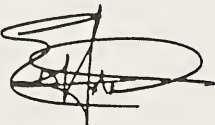
With partial loss of funding resulting from the retirement of Anna, LWC cannot meet the expenses associated with managing BFR. NSSG is financially unable to continue their support at the previous level, and AAZK, Inc. only has a total operating budget of \$70,000, yet you raise over \$120,000 a year to contribute to conservation programs outside this Association. Financial management of the Bowling for Rhinos must come from the program itself.

Starting with the 1996 BFR event, AAZK will utilize 4% or \$4000 of the funds received to pay for BFR - i.e. printing forms, mailings and associated expenses only. This money will also be utilized to pay for the contest winners" trips to the Sanctuary, a reward that LWC, NSSG and AAZK agree is essential to the continued success of the event.

I write this to you in an effort to maintain honesty and integrity with our membership. Bowling, Rummaging, Rockin, etc. for Rhinos is high profile, successful and makes a direct impact in wildlife conservation. One hundred percent of the money that you raise this year and in the future will go directly to support the BFR program and the wildlife of Africa and Indonesia.

As always, any comments you have on this or any other issue are welcome. Please take the time to write to me c/o Administrative Offices and we can discuss whatever is on your mind.

Thanks!



Ed Hanse, AAZK, Inc. Executive Director  
Tucson, AZ



## **AAZK Announces New Professional & Contributing Members**

Donna Giunta, **Staten Island Zoo (NY)**; Lynne Von Haggin, **Flag Acres Zoo (NY)**; Lisa A. Jandrasits, **Pittsburgh Zoo (PA)**; David Jobe, **Mill Mountain Zoo (VA)**; Steve DeCreise, **Central Florida Zoological Park (FL)**; Sylvia Inglefield, **Lowry Park Zoo (FL)**; Marisa Paulet, **St. Paul Como Zoo (MN)**; Laurie Mitchell, **Montgomery Zoo (AL)**; James Hardy, **Ober Gatlinburg Municipal Black Bear Habitat (TN)**; Peggy Gann, **Knoxville Zoological Gardens (TN)**; Deborah Scanlan, **Memphis Zoo (TN)**; Steve Parker, **Jackson Zoo (MS)**; Jane McEvoy, **Columbus Zoo (OH)**; Jennifer Howard and Elisha Taylor, **Indianapolis Zoo (IN)**; William Anderst, **City of Manitowoc/Lincoln Park Zoo (WI)**; Karla Sioux Stillely, Greg McCumsey and Karen Shaw, **Greater Baton Rouge Zoo (LA)**; Maureen O'Leary, **Tulsa Zoo (OK)**; Barbara Staples, **Dallas Zoo (TX)**; Jill Cox, **Utah's Hogle Zoo (UT)**; Lorraine McBride, no zoo listed, **Phoenix, AZ**; Rhonda Saiers, **Albuquerque Biological Park (MN)**; James F. Peddie, **EATM Program/Moorpark College (CA)**; Wattie N. Anderson, **Chaffee Zoological Gardens of Fresno (CA)**; Gregory S. Hamilton, **Honolulu Zoo (HI)**; Laurie L. Brogan, **Oregon Coast Aquarium (OR)**; Tonya Buzzard, **Wildlife Safari (OR)**; Mike Teller, **Woodland Park Zoo (WA)**; Jean R. Joseph, **Point Defiance Zoo & Aquarium (WA)**; Shannon Salter, **Metro Toronto Zoo (Ontario)**.

### **Renewing Contributing Members**

Richard Block, **Indianapolis Zoo, Indianapolis, IN**  
Susan Moy-La Veau, **Keeper,  
Lincoln Park Zoo, Chicago, IL**  
Kathy De Falco, **Volunteer, San Diego Zoo,  
San Diego, CA**  
John Bretton, **San Diego Zoo, San Diego, CA**  
Norman Gershenz, **Director  
Center for Ecosystem Survival,  
San Francisco, CA**

### **New Contributing Members**

Jean A. Marson, **Docent, Detroit Zoo, Detroit, MI**

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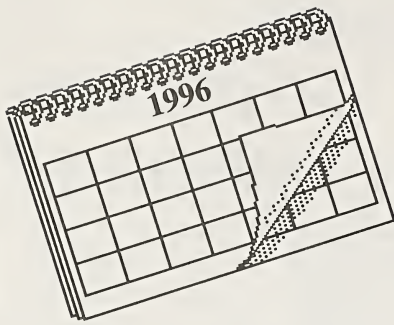
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**635 S.W. Gage Blvd.**  
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# Coming Events

**1996 Central Regional Volunteer Conference** - August 2-3, 1996 at Sioux Falls, SD. Hosted by The Great Plains Zoo and Delbridge Museum. For information contact: Jackie Goosen or Vanessa Lambert at (605) 367-7003 or fax (605) 367-8340.

**Animal Behavior Society 33rd Annual Meeting** - August 3-8, 1996 at Northern Arizona University, Flagstaff, AZ. There will be a pre-meeting symposium July 31-August 2: *A Synthetic Approach to Studying Animal Cognition: Examples from Specialized Domains*. For information contact: Dr. Con Slobodchikoff, Dept. of Biological Sciences, Northern Arizona University, Flagstaff, AZ 86011; email: Con.Slobodchikoff@nau.edu. For symposium information contact Dr. Russ Balda - email: Russell.Balda@nau.edu.

**American Federation of Aviculture 22nd Annual Convention** - August 7-10, 1996 in San Francisco, CA. Focus will be on Asian and Indonesian birds, with a special program on finches and softbills. Conference will feature many guest speakers, local tours of SF area and Marine World/Africa USA. For further information contact the AFA Business Office at (602) 484-0931.

**Association of Avian Veterinarians 1996 Conference** - August 27- September 1, 1996 in Tampa, FL. Meeting includes sessions on medicine, diagnostics, ratites, infectious diseases, environmental practice, etc. Also included will be practical application labs on surgical topics, parasitology, avicultural medicine. For more information contact the AAV Conference Office at (303) 756-8380.

**ZOOMANIA - 96 - Southeast Regional Docent Conference** - September 13-15, 1996 at Gulf Breeze, FL. Registration and hotel information available by contacting the Docent Council or Curator of Education at THE ZOO (904) 932-2229, ext. 27.

**Association of Zoological Horticulture International Conference** - October 4-12, 1996 in Greensboro, NC. For further information contact: Virginia Wall, North Carolina Zoological Park, 4401 Zoo Pkwy., Asheville, NC 27203; (910) 879-7400.

**23rd Annual National AAZK Conference** - October 5-10, 1996 in Detroit, MI. Hosted by the Detroit AAZK Chapter and the Detroit Zoo. Watch *AKF* for information/forms.

**Association of Zoo Veterinary Technicians 16th Annual Conference** - October 29 - November 1, 1996 in Puerto Vallarta, Mexico. Will include sessions on reptile, avian, primate, exotic hoofstock and aquatic medicine, immobilization, hematology, clinical pathology, hospital techniques and case reports. There will also be a wet-lab. For more information contact: Jenni Jenkins, LVT, National Aquarium at Baltimore (410) 659-4256; fax (410) 576-1080. For membership information contact Lisa Kolbach, LVT at White Oak Conservation Center at (904) 225-3396.

# Center for Ecosystem Survival Expands to Include Marine Conservation

By Norman Gershenz  
CES Director

Since 1989, the Center for Ecosystem Survival has played a significant role in bringing together a consortia of more than 70 zoos, aquaria, and conservation-minded institutions to address, in a creative way, the commitment of their resources and the resources of the public toward real on-the-ground, *in-situ* conservation and science.

Originally headquartered out of the San Francisco Zoo, the Center has found a new home at San Francisco State University where the Department of Biology and the college of Science and Engineering have graciously agreed to host this highly successful conservation program.

As we approach the millennia, I believe protection of coastal and marine ecosystems worldwide will become one of our greatest conservation challenges. Addressing that need and through the generous support of the David and Lucile Packard Foundation, CES created and developed the first ten prototype Marine Conservation Meters. The Marine Meter is part of an innovative fundraising campaign to engage the public in supporting critical aquatic habitat protection.

Over the course of last year, all ten Marine Conservation Meters were successfully placed into aquariums and zoos across the United States to raise funds and awareness for ocean conservation. The following institutions have placed Marine Conservation Meters: Monterey Bay Aquarium, National Aquarium in Baltimore, John G. Shedd Aquarium in Chicago, New Jersey State Aquarium, Point Defiance Zoo and Aquarium in Tacoma, Dallas World Aquarium, Marine World Africa/USA, Houston zoological Gardens, the Detroit Zoo and the Columbus Zoo. The combined attendance for the listed participating institutions has the potential to reach up to 10,650,000 zoo and aquaria visitors, generating understanding and financial support for *in-situ* coral reef conservation.

The Center for Ecosystem Survival in concert with aquaria, zoos, The Nature Conservancy, and other conservation groups has identified three marine protection sites and programs to receive 100% of all funds collected through the





Marine Conservation Meter program. They are Parque Nacional del Este in the Dominican Republic; Komodo National Park in Indonesia; and the Republic of Palau in Micronesia. Financial support includes on-site protection and science work, such as installation of buoys to prevent anchor damage, long-term monitoring of fish and coral reefs, survey programs, ecological assessments, and in-country educational outreach programs.

In addition to prototyping the ten Marine Conservation Meters, the Center for Ecosystem Survival completed, with the generous underwriting of the Pacific Telesis Corp., the design, development and production of educational outreach materials for school groups, zoos, and aquaria, and the general public. CES created the Adopt A Reef® program and brochure to raise funds from elementary school students and the general public across the nation for the conservation of endangered coral reefs and awards honorary deeds for gifts toward coral reef preservation. Brochures describing the Adopt A Reef® and the earlier Adopt An Acre® programs are available to AAZK Chapters and AAZK members interested in promoting these projects by contacting Center Director Norman Gershenz at the address given below.

For those not familiar with CES history, the Adopt an Acre program works to protect rainforest habitats around the world. CES has also expanded its Adopt An Acre program with the addition of a new conservation site in the Pantanal National Park in Brazil which offers the public the unique opportunity to purchase and protect 148,000 acres of ecologically important land, expanding the protected area by 43%. Other conservation sites under the Adopt An Acre® program are the Talamanca-Caribbean Biological Corridor in Costa Rica and the Amboro National Park in Bolivia.

For more information or to request brochures contact: Norman Gershenz, Center for Ecosystem Survival, San Francisco State University, Dept. of Biology, 1600 Holloway Ave., San Francisco, CA 94132

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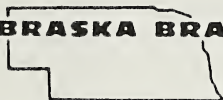
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## Animal Behavior Concerns & Solutions

A Question and Answer Forum for the Zoo Professional

By Diana Guerrero

Independent Behavior Consultant, Ark Animals of California, San Diego, CA

### BEHAVIOR EVALUATION: CALIFORNIA SEA LION (*Zalophus californianus*)

#### QUESTION

Over the past year and a half our institution has begun conditioning two California sea lions (*Zalophus californianus*) for husbandry purposes. We have recently been encountering some difficulty along with some aggression. Do you have any recommendations?

#### BACKGROUND

The two animals in this scenario are male sea lions, the older animal is twice the age of the younger. Neither animal has been worked previous to the training efforts of this institution.

The older male has some difficulty with visual acuity due to loss of eyesight. He is less curious but shows keen interest in sessions and in performing well. The younger male is more human oriented and is very curious. He will antagonize the older male. He was neutered at a young age to minimize antagonistic behavior between the males due to natural competition.

#### ANIMAL PROFILES

Both animals show high interest in their training programs. Each exhibit behavior readily when asked. The younger male grasps training concepts quickly and learns with two or three repetitions (if the trainer is clear) while the older male takes six or more. It is suspected that the older male sees shadows and/or movement. He appears to get frustrated or confused and will engage in time-out behavior (going into the water) when he approaches that point.

#### ADDITIONAL NOTES

There have been up to six different trainers/keepers working these animals. Each has individual variances that affect behavior. This has resulted in some superstitious behavior being trained. Recently the training staff has been reduced to four individuals. All are highly motivated in their involvement with the program and show a good aptitude for training. All use variable reinforcement to the same degree and the protocol is clearly delineated to avoid confusion of staff or animals.

The commitment and cooperation between training/keeper staff members toward the program is exceptional and although there are differences each staff member is committed to making the program work.

Team meetings occur once a month. For training stability and progress it is

recommended that the trainers informally discuss sessions, concerns, and feedback at least weekly.

## **CHALLENGE AREAS**

Any time training is done involving several animals there are more dynamics and complications which must be attended to. This is further complicated when you involve multiple training personnel. Cross communication before, during, and after sessions is important.

The record keeping and criteria is very clear and concise. However, staff interpretation of responses seem to be more human oriented versus the animal oriented viewpoint. Since some of the staff have traditional training background, there is a tendency to push ahead quicker than necessary or desirable.

In addition, striving for consistency has resulted in some predictability in the training patterns. Consistency refers to being clear and constant in criteria, level of performance, rewards, and bridging. Predictability is when behaviors are asked for in the same sequence, in the same areas, or in the same repetitive manner. The animals begin to chain the behaviors or anticipate what will be asked.

## **ACTION STEPS**

Recommendations for improvement are minor. Staff has evolved beyond the beginning area and just need minor adjustments and guidance. The following notes are specific to this scenario but also to numerous others since these "growing pains" are common trends for new trainers and new animals.

### **1. STOP WHEN YOU ARE SUCCESSFUL**

It is not necessary to complete training a behavior in one session. End on a good note instead of continuing the session with other behaviors. One or two behaviors worked allow fine tuning which form a more stable foundation and will result in stronger training results later. Focus on nuances such as relaxed body posture, longer duration of a behavior, and more specifics. **EXAMPLE:** On a down first get the down, then get a relaxed position, then a relaxed position without animal movement, then a relaxed position while you move around, etc.

### **2. WHEN YOU ARE EXPERIENCING DIFFICULTY WITH A BEHAVIOR GO TO ANOTHER BEHAVIOR THAT IS PREDICTABLY SUCCESSFUL. REASSESS YOUR APPROACH FOR NEW BEHAVIORS.**

If you are having difficulty go to another behavior and get success. Don't reward this with a primary reinforcer use a conditioned reinforcer. Get the behavior again and then reward with a primary reinforcer. You can then move back to try the first behavior. Only ask once, if you don't get the behavior then either end the session or move into something else and leave it. **NOTE:** Make sure to troubleshoot if the same behavior is causing difficulty repeatedly. Check to see how other trainers are experiencing that behavior.

### **3. PAY ATTENTION TO NUANCES**

Watch for behavioral clues. Body tension, tail and whisker positions, and breathing will give you clues to how your animal is feeling or liable to react. If you are bridging for a target make sure the mouth is shut or you will reinforce a superstitious behavior.



#### **4. WORK QUALITY NOT QUANTITY**

Work more on fine tuning behaviors versus all the repertoire. This will help with boredom and predictability. You will need to decide on some variations or new behaviors to train in the near future to keep both animals and trainers healthfully occupied.

#### **5. AVOID DISTRACTING TRAINERS FROM THEIR SESSIONS**

Verbal interactions from staff and public should be minimized to avoid problems caused through distraction. Distractions can result in improper bridging, and aggression.

#### **6. RESIST TEMPTATION TO REPEAT COMMANDS OVER AND OVER AGAIN**

Repetition is unnecessary and can result in the animal desensitizing to the trainer's directives.

#### **7. REVIEW AGGRESSION PROTOCOL**

In at least one instance it appeared that an animal showed minor aggression (threat) to the working trainer and although the trainer got the animal to respond, the trainer rewarded the animal with a primary reinforcer (which, in essence rewarded the aggression.) **NOTE:** This individual trainer was bit by the same animal shortly after that incident.

#### **OTHER**

With the older sea lion use brighter tools. Be sure to note responses from each side of the animal and which appears to get stronger or more predictable response. Sunlight could also blind/prevent the animal from responding properly so be aware.

Ask for a behavior only once or twice and then move on or take action as you see appropriate. Multiple commands for one behavior serve no purpose.

Do not go to the animal, get them to respond to you. Most new trainers will allow the animal to lead or crowd them. Reinforce stationary behavior on the target to correct this. Move the target not your body to adjust or reposition.

Feel free to use the conditioned reinforcer (bridge) more frequently to train more specifics. Make sure you are not just using this tool at random. The older sea lion will benefit from this feedback and can be expected to catch on better.

Go slow and easy with the older sea lion. He is like working with a senior citizen and although he has learned to learn he is slower to process and needs more time to think and respond than his younger counterpart. Taking slower steps will make sure you are all successful. Get the base behavior secure and solid before you relocate it to a new area or introduce other variables. Be very clear and concise in what you want and in the cues.

When training new behaviors only one person should be working on that behavior until it is completed. That person should then train and check off other trainers on the behavior for consistency.

When the animal is non-responsive do not automatically assume it is refusal on the animal's part. You may not be clear and the animal could be confused or

frustrated. The older sea lion tends to engage in a time-out when he gets to that point. What your interpretation is of a behavior is not always what the animal's interpretation is.

### **EXAMPLES:**

A "stay" behavior was engaged in being trained. What I observed was the animal interpreting the behavior to be opening the mouth. I also interpreted the behavior requested to be the open mouth based on the bridging and cue of the trainer. Then the trainer introduced more variables before the behavior was trained. The sea lion began offering variations and other behaviors to try and determine what the trainer wanted. Slower steps and bridging smaller nuances would have resulted in success.

In domestic training this can be seen with a dog being trained to "sit." While the behavior is a position to us, it is not to the dog. This is easily seen after the dog has been trained to lower the hips to the ground for a "sit" and then is requested to "sit" from a "down" position. The dog will often look at the owner and not move since his interpretation has been the movement. Once encouraged to move up into the position from the "down" the dog can make the connect to one of position rather than movement.

The common error many new trainers make is to assume the animal is refusing to respond when the animal is thinking or not understanding the directive.

It is anticipated that forward momentum can be re-established after consistent application of these recommendations. Staff acquisition of new skills suggested is estimated at 30 to 45 days of consistent practice.

### *Next month Chimpanzees!*

*(About the Author: Since 1978 Diana has been active both in the U. S. and England working with zoos, private collections, an oceanarium, a marine aquarium, and other animal-related organizations involving captive wildlife. She has a broad base of animal experience involving movie & television training, zookeeping, show performances with live animals, education, behavior management, modification and enrichment, rescue and rehabilitation as well as captive breeding and management of endangered species. She currently works as an Animal Behavior Consultant and Trainer for Ark Animals of California working with both exotic and domestic animals. She has authored numerous articles on animal behavior and training. If you have questions for Diana, you may contact her at 1-800-818-7387 or visit her Home Page at <http://www.ni.net/brookhouse.com>)*

### **Correction.....**

Please note the following clarifications on the article "The Philadelphia Story--A Keeper's Grief" which appeared on pages 209-215 in the May 1996 issue of AKF: 1) The 0.1 lowland gorilla, Jessica, currently in San Diego, is mother-rearing both kids with no need of human intervention; 2) In the two-page photo spread of the animals lost in the fire, the photo showing species interaction between 1.0 white-handed gibbon Octavian and 0.1 Bornean orangutan Jingga Gula was taken by Tom Hartman not Dana B. Grubb. *corrections submitted by JoAnne Adams, The Philadelphia Zoo.*



# *Animal Reintroductions and Endangered Species, Part 2*

*By Terry D. Webb, Sr. Keeper, Primate Department  
Brookfield Zoo, Chicago Zoological Society, Brookfield, IL*

## **Guidelines For Reintroductions**

Most authorities and specialists understand in order for a reintroduction plan to be attempted and be of long-term benefit, a strict set of guidelines must be followed (Brambell, 1977; Junguis, 1978; Temple, 1983; Wemmer & Derrickson, 1987; Shepherdson, 1990, and Olney, Mace, & Feistner, 1994). In IUCN/SSC Reintroduction Specialist Group, the ICBP, the International Wildfowl and Wetlands Trust, and David Shepherdson and M.R. Brambell of the Zoological Society of London all describe and recommend a set of guidelines to be followed when a plan is to be considered (Brambell, 1977; Junguis, 1978; Shepherdson, 1990; & Olney, Mace, & Feistner, 1994):

**1). Feasibility Study:** Determine the ecological status of the species and its environment, current and future biological and non-biological changes to the ecosystem, socio-economic costs to the human population, availability and suitability of animals to be reintroduced, and if there are existing national and international laws to protect the animals. If the guidelines of the feasibility study are met it is recommended to proceed with the plan if adequate and suitable areas of habitat are present to support a viable population, if the causes of extinction have been removed or no longer pose a threat, if there are no risks to the human population, and if the released animals will not threaten any existing populations when released or in the future.

**2). Planning/Preparation:** The animals need to be in excellent condition and examined for health concerns before release. There must be no health concerns at the release site. The strategy for release (season, time of day, acclimatization time, group composition) must be agreed upon. Proper funding must be available throughout all phases. Pre- and post- release monitoring plans must be developed. Approval from all government departments and conservation agencies must be secured.

**3). Assessment:** The project should be assessed as soon as possible with the findings being published and available to reputable sources for evaluation (Gipps, 1991). The literature reviewed placed a strong emphasis on the priority to maintain natural ecosystems and biological processes. The reintroduction should be a multi-disciplinary plan involving a broad ecological and socio-economic strategy to restore, maintain, and protect all aspects of an ecosystem. There are many issues relevant to the success or failure of a reintroduction. The effectiveness of a reintroduction involves both biological and non-biological factors. There must be a commitment to all the criteria in

order for a program to be developed, implemented, maintained, and successful. It should be concluded that reintroduction will only be realistic for certain species.

## **The Roles of Zoos and Conservation Organizations**

Zoos and other conservation organizations have developed programs (Taxon Advisory Groups, Captive Breeding Specialist Groups, Species Survival Plans, and Reintroduction Specialist Groups) all with an interest in captive breeding and in situ conservation. The reintroduction specialist groups of the International Union for the Conservation of Nature (IUCN) had completed twenty-four Action Plans by 1992 which were developed to determine how often reintroductions are recommended (Olney, Mace, & Feistner, 1994). The methodology most often utilized within these Action Plans is Protected Area Management. Protected Area Management is the maintenance and protection of ecosystems. Establishment and management of these protected areas is essential to ensure sufficient habitat will exist for reintroductions to occur and to protect the biodiversity in the area. These Action Plans involve 68 threatened animal species. Most species are not chosen for reintroduction due to loss of habitat. Any factors that have contributed to the extinction of a species must be eliminated.

Many authorities prefer to concentrate their efforts on preventing the disaster which would force the use of reintroductions (Mallinson & Durrell, 1987; Shepherdson, 1990; & Sunquist, 1993). Returning animals to the wild may only be a display of man's ability to "fix something". This problem may not be fixable, even if the species is returned to the natural areas in which it once thrived. It is vital to hold on to natural areas, as Kleiman demonstrates with the question, "Can man save enough species to recreate and maintain an ecosystem with all its biodiversity?" (Sunquist, 1993).

Ulysses Seal, Chairman of the IUCN-World Conservation Union's Captive Breeding Specialist Group views are that reintroductions are essential: "...My philosophy is that the ark provides options. If we don't do something now, then in 35 years we will lose somewhere between 1000 and 2000 vertebrate species; they won't be around for the options to be tested" (Sunquist, 1993).

Stanley A. Temple asks if these plans are realistic goals. "Not all birds bred in captivity can be successfully reestablished in nature, but for those that can, for those that meet the criteria for success, we should pursue reintroduction programs as vigorously as we can" (Temple, 1983). David Shepherdson believes that the reintroduction of captive bred animals into the wild will only play a relatively minor role in conservation (Shepherdson, 1990).

Norman Myers states, "Several analyses show we are losing between 50-150 species daily, or 15-20 percent of all plant and animal species within 20 years" (Myers, 1993). Betsy Carpenter points out that, "Biologists estimate that one-third of the plant species face extinction over the next two centuries" (Carpenter, 1992). The conservation efforts of zoos and other organizations with reintroduction programs ensures that all species receive local and international attention and arouse support from society. The consensus is that many species require programs to be put into place, but only certain species will ever become candidates for reintroduction.



Lindburg states, "Reliance on any single strategy actually increases the risk of extinction to an unacceptable level" (Lindburg, 1992). Single minded approaches to conservation increase the risk of extinction by over-selling one idea. It is very important to approach conservation efforts from a large scale perspective. Social, political, and economic issues must be considered when making a conservation decision. Scientific studies, policies, and responses of government agencies and conservation groups need to interface during the decision making process. The IUCN recommends that species be reviewed and the type of conservation effort chosen be of a category most appropriate for that species, ranging from education to trade controls. The "back to the wild" choice should be made when it is feasible and applicable for species under consideration for reintroduction.

### **Criteria for Determining Success of a Reintroduction**

The success of a plan should only be measured against its goals and objectives. Colin Tudge is assertive and confident that the end point of captive breeding is reintroduction (Olney, Mace, & Feistner, 1994). Most specialists note that it is difficult to find objectivity with the effectiveness of reintroduction programs as a conservation method. At a symposia of the Zoological Society of London, Mark R. S. Price detailed all factors relevant to a successful reintroduction. He linked non-biological and biological factors through an elaborate interface which would yield a successful plan of attack for a reintroduction (Gipps, 1991). To begin with, establishment of a viable self-sustaining population is a long term process and most projects have not been up and running long enough for an accurate assessment to be made. Release strategies and follow-up monitoring activities for each species are difficult to develop and pose unique problems which take time to refine. Finally, some programs were poorly planned without record keeping or post-release monitoring. Current reintroductions in place or in the planning stages are carried out more conscientiously. The estimates of success may be provisional and the indirect benefits could often be more beneficial to conservation where a viable population may never occur. The programs considered to be of the greatest success have all been multi-disciplinary and comprehensive involving many individuals and resources.

Overall it is clear that all authorities and sources will at least explore and consider reintroductions as an option for the conservation of a species. The extent to which reintroductions have been carried out and documented has been limited. Hopefully, future programs will have greater documentation which will expand the data base. This should allow for an easier determination for this approach and for the measurement of a program's success. These ideas are foremost in the eyes of the Reintroduction Specialist Group of the IUCN:

"...the objective of this group will be to collect and disseminate information on all reintroductions, in the hope that this may be of practical help to those contemplating reintroduction. One of their first tasks will be to compile a bibliography of reintroductions and translocations". (Shepherdson, 1990).

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# Baby Elephant Walk....



Night Keeper John O'Faolain of The Oakland Zoo, Oakland, CA sent in this photo of six-month-old male African elephant calf, Kijana, walking the park grounds with Keeper Greg Gilbert. The youngster, who weighed 190 lbs. (86kg) was rejected by his mother, Lisa, and is being raised by a relay of keepers and volunteers. Two calves were born a few weeks apart to different mothers at the facility. The calf born to Donna was injured at birth and had to be euthanized. Kijana was born in the outside yard and fell to the ground during delivery. The other calf was born indoors and fell to a concrete floor, possibly accounting for the injuries.

The Elephant House staff believe that both females may be pregnant again as their bull, Smoky, has been seen breeding both cows. The third cow, M'Dunda, will not let the bull near her. We will await further updates from Oakland.



# **Enrichment and Training of Lappet-Faced Vultures**

*(Torgos tracheliotus)*

## **at the Baltimore Zoo**

**by Carolyn Atherton, Bird Keeper II  
Baltimore Zoo, Baltimore MD**

Until the summer of 1995, the Baltimore Zoo exhibited a pair of sibling Lappet-Faced Vultures who were hatched at the zoo in 1991 and 1992. They were exhibited by day in a yard approximately 10.7 meters by 6.1 meters (35 feet by 20 feet). There was always adequate perching available, though the birds prefer to stand on the ground during the day. At night, they were moved to indoor quarters.

We found that these birds were very destructive to plants in their exhibit. They uprooted and shredded ornamental grasses and stripped any bushes or tree branches within reach. We surmised that they were exhibiting behaviors that are natural in the wild, where they would spend a considerable amount of time tearing and shredding carcasses while feeding. To cut down on the destruction of the exhibit, we began looking for enrichment items to keep them occupied.

The materials we use for enrichment items are primarily food items and sisal rope, which are cheap and readily available. Food items used consisted of chicks, mice, rats, as well as bones purchased through the local grocery store. The vultures' main diet consists of Nebraska Brand Bird of Prey Diet, so these other items are considered treats for them.

We use 1/2" sisal rope for wrapping perches for vultures housed indoors. (Sisal rope has very short fibers, so if the birds pick at it, the loose fibers are not likely to wrap around toes or any other extremities, as can happen with nylon rope fibers.) Since some of the vultures routinely strip the rope from their perches, we decided to try it as an enrichment item.

The sisal rope worked very well for tying "toys" to trees in the yard. We tied small dead bushes, old tree roots, and stalks of bamboo to the largest tree in the yard, and left them dangling within reach of the vultures. The objects were tied loosely enough that a reasonable amount of tugging would bring them down where the vultures could then shred them at their leisure.

Another way we used the sisal rope was by itself. We cut pieces about one meter in length and tied them into a large knot. Then the knots were thrown out into the yard, one per bird. The birds usually spent anywhere from thirty minutes to a full hour playing with the ropes initially and they would return to

them several times during the day to pick over the pieces. At the end of the day, when the birds were moved back to their indoor quarters, clean-up took just a moment with a rake.

Occasionally, we would cut long pieces of bamboo and stick them in the ground in one corner of the vulture's yard. This would provide a small shade area, and if they wanted to, the vultures could pull out the bamboo and tear it up. We also hid small food treats, such as a rat or a few chicks, in the middle of a bundle of small sticks tied together with sisal rope.

Once a week, all of the vultures are given bones to pick at. We give them either marrow bones, sawed into 3" pieces, knuckle bones, or pork neck bones. These are purchased at the local grocery store on the day they are to be fed.

The Lappet-Faced vultures seem to respond very well to food and so we decided to try to set up a short presentation about vultures. The training of Kenya and Kalahari, two juvenile lappets, was accomplished by using food as a reward. They were trained to jump up on perches and spread their wings on cue for zoo guests while a short presentation was being given.

We began training with the female vulture, Kenya (hatched in 1991). She was the dominant bird of the pair. Five days a week, Kenya was given a training session first thing in the morning in the exhibit, while Kalahari was left in the overnight quarters. As soon as she finished her session, Kalahari would be let out into the exhibit.

It was discovered that mice were Kenya and Kalahari's favorite treat food, so they were deleted from their daily diet and used solely for training.

At first Kenya was offered pieces of mice from a pair of 40" snake tongs. A training whistle was blown each time she accepted a piece. Once she caught on that the whistle meant food, we began using the food to lure her over to her perch, and then to jump up on the perch when given a hand signal.

Individual training sessions were kept short, no more than ten minutes a day, so she would not get tired or frustrated. The sessions were also progressive so that she always had to do a little more, or a little better, each day to receive all of her mice.

Kenya showed considerable learning ability. The commands for "up" and "down" from the perch were mastered in about three weeks. A cue for her to spread her wings and hold them extended was learned in about another month. This was accomplished by lightly tapping her wings when she was immediately rewarded with food. Eventually blowing the whistle after each command was completely phased out and Kenya responded totally to hand signals and vocal commands only.

Several months later, Kalahari (hatched in 1992) was allowed out in the yard to



watch Kenya in her training session. After watching only three sessions, he began to jump onto the perch next to Kenya for his own food reward. He caught onto the entire routine in less than two weeks, just by learning from Kenya's example. Both birds were used for informal presentations for two years.

As might be expected we found that Lappet-Faced vultures respond well when provided with enrichment opportunities. Enrichment eases boredom for the birds, cuts down on exhibit destruction, and provides the public with the opportunity to see the birds active. In addition, the short presentations we gave with Kenya and Kalahari provided our zoo guests with information on a much maligned group of birds and their role in the wild.

### Acknowledgments:

Many thanks to Liza Herschel of the Education Department for her information on bird training techniques, and to James Ballance, Senior Keeper of the Bird Department for his assistance and support.

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# ***Bowling for Rhinos Update***

*submitted by Patty Pearthree, BFR Coordinator  
Indianapolis, IN*



Bowling for Rhinos is not limited to just bowling. Some other BFR funds are raised through Rock n' for Rhinos, Rummage for Rhinos, Run for Rhinos, Recycle for Rhinos, Gambling for Rhinos, or donations. If you have any questions, please call me at (317) 322-8723. Checks should be made payable to "AAZK, Inc." and mailed to: Patty Pearthree c/o Bowling For Rhinos, P. O. Box 199026, Indianapolis, IN 46219-9026.

If you have not done so already, please drop me a line to let me know your event date and how interested parties can join your event. I get quite a few inquiries from around the country and would like to be able to give current information.

## **"Bowling for Rhinos Sanctuary" Trip Rules**

1. The top two money raisers each year in "Bowling for Rhinos" will each win a two-week trip to the Ngare Sergoi Rhino Sanctuary near Isiolo, Kenya.
2. The two (2) individuals will visit the Sanctuary together and arrange their trip with the assistance of the BFR Coordinator and through the Administrative Office of AAZK, Inc.
3. The two winners may each bring a guest, but the guest must pay their own expenses and be able to lodge in the same room as the winner.
4. The winners' trips are paid for from a fund administered by the Lewa Wildlife Conservancy and AAZK, Inc. These funds are derived from 4% of the yearly BFR monies raised and/or funds contributed by LWC and AAZK, Inc. The allowance for each plane ticket shall not exceed \$1700 (1996).
5. The winners **must** be a paid, National AAZK members at the time of their bowling event.
6. The same person can only win the trip once. This is to encourage more people to try to win, and give an opportunity for more people to visit the Sanctuary and see the benefit of their hard work.
7. Canadians count their total funds raised in Canadian currency. Therefore, if a Canadian member raises \$5,000 but it only equals \$3,000 in U. S. dollars, the \$5,000 amount counts in the contest.
8. Only money which is turned in to the BFR National Coordinator **by 1 September** of the same year can be counted in the contest.

# ***ELECTION.....'97***

Hey, Everyone! Do you know anyone who wants to be more involved in AAZK? Well, it's election time again, so put on your thinking cap and put in your nominations for who you want on the Board of Directors. There are three positions open - those held by Ric Urban, Janet McCoy and Michael Illig whose terms expire at the close of the 1997 National Conference. New board members will serve a four-year term from the close of the 1997 National Conference until the conclusion of the 2001 National Conference. Please fill out the following Nominator and Nominee Biographical forms and send to the address listed.

Why is this first call for nominations so early? **TIME** is the answer. Nominations, candidates verification and tallying mailed ballots require time. We also wish to notify winners early enough to allow them to make arrangements to attend the National AAZK Conference **before** they assume office. This will enable the new Board Members to become familiar with Board responsibilities and AAZK activities before they assume responsibility for our organization.

## **Duties of the Board of Directors**

For a more detailed explanation of the expanded duties of the Board, refer to the By-Laws (available upon request from Administrative Offices in Topeka, KS).

- 1) Select, appoint or remove officers, committees, agents and employees of the Association, including - prescribing powers and duties.
- 2) To control and manage the Association and its property, passing upon acquisition and disbursements with approval of a majority of the Board.
- 3) To formulate policies, rules and regulations in accord with the Constitution & By-Laws.
- 4) To uphold the Constitution of AAZK and the policies of the Association.
- 5) To appear at Board meetings, to accept Board assignments and to devote the time to communications pertinent to all Board business, including answering correspondence promptly and efficiently.

## **Qualifications for Nomination**

- 1) Nominee must be a Professional Member of AAZK, Inc. in good standing and must have been a member of the Association for at least one year.
- 2) Nominee must be presently employed as an animal keeper/attendant, veterinary technician, research technician or other personnel directly connected with the care, feeding and educational display of captive wildlife in a recognized zoological park, aquarium, animal reserve or other animal care facility in the U.S. or Canada and must have been in the zoological field for at least two years.

## **Nomination Procedure**

### **1) Nominator Form:**

- a.) List the name of the nominee, phone, address, and institution.
- b) State in 150 words or less the reason(s) why the nominee warrants election to the Board of Directors.
- c) Nominator signs forms and mails to NEC Chairperson.
- d) Notifies nominee that they nominated him/her for the Board.

### **2) Nominee Biographical Form:**

- a) Professional background: places of employment, length of service, titles.
- b) Membership in AAZK: National and local chapters, number of years, offices held, involvement in activities.
- c) Educational background.
- d) Membership in Affiliate Organizations: (AAZPA, Audubon, etc.)
- e) State in 500 words or less why you would like to be on the BOD and any other pertinent information. (optional)
- f) References (one or two)
- g) Nominee signs forms and mails to NEC Chairperson.

**NOTE:** Candidate is ineligible for nomination if **both** the nominator and nominee biographical **forms** are not **complete** and **returned** to the NEC Chairperson **by 31 January 1997**. Send to: Sheri Leavitt NEC Chair, Houston Zoological Gardens, Children's Zoo, 1513 N. MacGregor Way, Houston, TX 77030; fax (713) 525-3330.



# **Nomination Form for** **AAZK Board of Directors**

## **Qualifications for Nomination:**

- 1) Nominee must be a Professional Member of AAZK and must have been a member of the Association for at least one year.
- 2) Nominee must be presently employed as an animal keeper/attendant by a recognized zoological institution or aquarium in the U.S. or Canada and must have been in the zoological field for at least two years.

### **1. Name of Nominee:**

**Address:**

**Phone:**

**Institution:**

**Director:**

### **2. State in 150 words or less the reason(s) why the nominee warrants election to the AAZK Board of Directors.**

### **3. Signature of Nominator:**

**4. Form must be received by the NEC Chairperson by 31 January 1997. Send to: Sheri Leavitt NEC Chair, Houston Zoological Gardens, Children's Zoo, 1513 N. MacGregor Way, Houston, TX 77030; fax (713) 525-3330.**

# **Nominee Biographical Form** **for AAZK Board of Directors**

(To be completed by Nominee)

**1. Name:**

**Address:**

**Phone:**

**PLEASE LIST THE FOLLOWING INFORMATION**

**2. Professional Background: (places of employment, length of service, titles)**

**3. Membership in AAZK:**

**a) National: number of years**

**Activities:**

**b) Local Chapter(s): number of years, offices held, involvement in activities.**



**4. Educational Background:**

**5. Memberships in Affiliate Organizations: (AZA, Audubon, WWF, etc.)**

**6. State in 500 words or less why you would like to be on the BOD and any other pertinent information. (optional/use additional paper if needed)**

**7. References (one or two): give name, address and phone number where they can be reached:**

**8. Nominee's Signature:**

**9. Form must be received by NEC Chair by 31 January 1997. Send form to: Sheri Leavitt NEC Chair, Houston Zoological Gardens, Children's Zoo, 1513 N. MacGregor Way, Houston, TX 77030; fax (713) 525-3330.**

# Internet Address Update

For those of you who like to cruise the Net here are the World Wide Web addresses of some environmentally "green" groups you might like to check out:

1. E/The Environmental Magazine - <http://www.emagazine.com>
2. Ecomall - <http://www.ecomall.com/ecomall/>
3. Econet - <http://www/econet.apc.org/econet/>
4. Envirolink Network - <http://www.wnvirolink.org>
5. Environmental News Network - <http://www.enn.com:80>
6. Essential Information - <http://www.essential.org/monitor/monitor.html>
7. Green Market - <http://www.greenmarket.com>
8. Greenpeace International - <http://www.greenpeace.org>
9. League of Conservation Voters - <http://www.lcv.org/>
10. National Audubon Society - <http://www.audubon.org/audubon/>
11. The Nature Conservancy - <http://www.tnc.org>
12. People for the Ethical Treatment of Animals (PETA)-  
<http://envirolink.org/arrs/peta/Index.html>
13. Rainforest Action Network - <http://www.ran.org>
14. 20-20 Vision - <http://www.2020vision.org>
15. African Wildlife Update - <http://www.africanwildlife.org>
16. WebActive - this is not specifically an environmental site, but includes lots of environmental information and links. WebActive's speciality is connecting activists to information and action items - <http://www.webactive.com>

If you find you have trouble finding your way around on the Internet, it may help to use one of several "search engines". These "search engines" help you cruise the Web by entering a "keyword" such as "zoos" or "wildlife". The most popular of these Internet helpers are:

**Yahoo** - <http://www.yahoo.com/>

**Lycos** - <http://www.lycos.com/>

**Webcrawler** - <http://webcrawler.com/>

**InfoSeek** - <http://www2.infoseek.com/>



*The GreenDisk Journal* has recently published a comprehensive guide to the environment online, listing over 1,000 Websites, listservers, online databases and bulletin boards. It is available in either IBM or Macintosh formats for \$25 from Greendisk, P.O. Box 32224, Washington, DC 20007.

Do you visit a Website that you find particularly interesting to you as a zoo person? Share the address with your fellow professionals. Send info to **AKF** and we will try to run regular Website address updates.





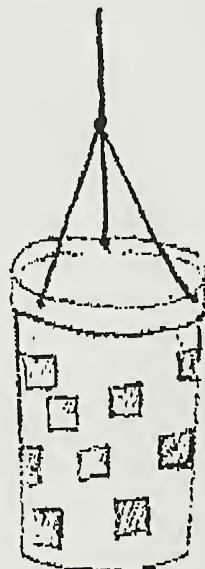
# ENRICHMENT OPTIONS



Psychological Stimulation  
Behavioral Enrichment  
Activity Manipulation  
Occupational Husbandry

*By Kayla Grams, Arizona-Sonora Desert Museum  
and Gretchen Ziegler, Sequoia Park Zoo*

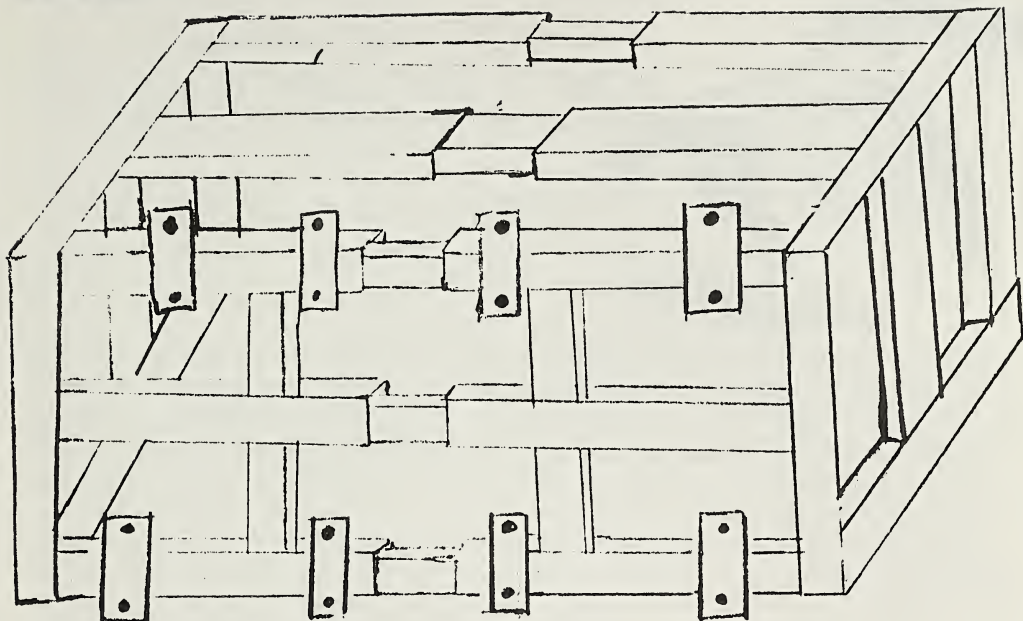
**DISCO FEVER** - Has your cat or dog ever chased the beam of a flashlight or the reflection of your watch? Zoo animals can be equally as intrigued. This inexpensive and easy to make apparatus simulates the random moving spots of light of a 'disco ball'. Take a plastic cup/tumbler (like the souvenir cups sold at refreshment stands) and super glue two dozen or so 1 x1-inch plexiglass mirrors (found at hardware stores) to the sides in a random pattern. Punch holes in the lip and hang mouth up with a string. Natural sunlight and a slight breeze create a flashback to twenty years ago. We placed ours in an outside, off-exhibit small cat holding area. The ocelot and bobcat have showed the most interest, but it can be used with a variety of animals. We have also tried this with our magpie jays.



*—Taylor Edwards, Keeper  
Arizona-Sonora Desert Museum,  
Tucson, AZ*

**ELEPHANTS** - The ToyBox shown on the opposite page was designed for our Asian bull elephant, Coco, who, if given a toy without any protection, would break it or tear it apart. The Columbus Zoo pachyderm crew came up with the idea from the hanging feeder barrels we would hang outside his transfer pen. The ToyBox is basically a cage that can be hung on the outside of his enclosure or mounted to the floor or wall. This allows him to play with a variety of toys from Boomer Balls® to browse. The ToyBox is a steel cage that telescopes. This allows it to go from 6 ft. at the shortest to about 11 ft. at its full length. The ToyBox is two feet wide and three feet tall.

## ToyBox



—Richey Placek, Keeper  
Columbus Zoo, Powell, OH

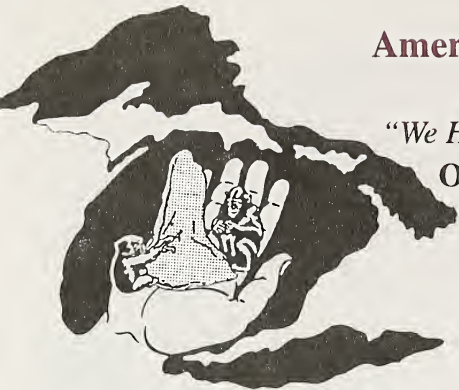


**PRIMATES** - Summertime enrichment! Freeze grapes when they are on sale and offer them to monkeys on hot days. This lesser spot-nosed guenon (*Cercopithecus buttikoferi*) loves frozen grapes, but draws back his lip and makes a face — and eats them more slowly than regular grapes.

—Camille Dorian, Keeper  
Monkey Zoo, Orinda, CA

*(Ideas appearing in this column have not necessarily been tested by the editors for safety considerations. Always think ahead and use good judgement when trying new ideas. Eds.)*





## American Association of Zoo Keepers, Inc. 1996 National Conference

*"We Have The Tools To Change Our Environment"*

October 6-10, 1996, Detroit, Michigan

Hosted by the Detroit Chapter of AAZK and  
The Detroit Zoological Institute

The Conference site will be the Cobo Exhibition/Conference Center across the street from the Conference hotel, the Crowne Plaza Pontchartrain. This site has direct access to the People Mover Monorail which will put delegates within minutes of many local attractions, restaurants and shops. Windsor, Canada with its casinos is only minutes away via the Ambassador Bridge or Tunnel. This diverse Conference will include business meetings, paper presentations, workshops, zoo & aquarium tours, exhibitors, poster presentations, a journal room, silent & live auctions and international speakers such as Dr. Birute M. F. Galdikas, well-known for her research on orangutans in Indonesia, and Anna Merz, founder and patron of the Ngare Seroi Rhino Sanctuary in Kenya. Tony Vecchio, Director of the Roger Williams Park Zoo, will also be giving a presentation on Earthwatch. Areas of interest for aquarists will include programs on sharks and SCUBA. Also planned is a riverboat cruise from the Belle Isle Zoo & Aquarium to Downtown Detroit, an Icebreaker at "The Top of the Pontch" overlooking the Detroit River and Canada, and a Cobo Riverfront Ballroom Closing Banquet.

**A Reminder** that a Pre-Conference Trip (Michigan Loop - 1 day) is scheduled for Saturday, 5 Oct. and will include the Binder Park and John Ball Zoos. Cost is \$30 per person and reservations are due **by 1 Sept. 1996**. Pre-Conference contact person is: Stephen Weaver (810) 398-0903.

A Post-Conference Trip (Ohio Loop - 3 days) is scheduled for Friday, 11 Oct. - Sunday, 13 Oct. It will include visits to The Wilds, Cleveland Metroparks Zoo and Sea World of Ohio. Trip includes all transportation, 2 nights hotel accommodations (double occupancy), 2 breakfasts and 2 lunches and costs \$230 per person. A \$125.00 deposit is due **by 1 Sept. 1996**. Post-Conference Trip contact person is: Michelle Seldon-Koch (810) 398-0903 Ext. 3153.

Pre- and Post-Conference Trip Reservations should be sent to: Michelle Seldon-Koch, Detroit Chapter of AAZK, Detroit Zoological Institute, P.O. Box 39, Royal Oak, MI 48068-0039. Make checks payable to Detroit Chapter of AAZK.

**Exhibitor's Tables:** If your Chapter is interested in having a table in the Exhibition Hall, contact Kervin Koch at the address above. Tables are \$30 member/\$60 nonmember.

**Registration/Hotel Forms/Travel:** Are available in the April and June 1996 issues of AKF or contact AAZK Administrative Offices (10800-242-4519). AO can also provide you with information on Continental Airlines travel arrangements. Keep in mind that special Conference hotel rates are guaranteed **only until 20 Sept.** Late Conference Registration fees are charged after 1 Sept.

Aldabra tortoise, Bactrian deer, Zebra mussel, Mandrill, Pinktoe tarantula, Chocolate chip starfish, Pudu, Emu, Discus, Sea apple, Red kangaroo, Slow loris, Bladder snail, Chimpanzee, Giant anteater, Wyoming toad, Ruffed lemur, Bowfin, Ocellated stingray, Emperor scorpion, Marconi penguin, Greater kudu, Komodo dragon, Indian elephant, Wolverine, Striped hyena, Sloth bear, Cobalt blue tarantula, African greater flamingo, Galapagos tortoise, King penguin, Vervet, Japanese macaque, Matschie's tree kangaroo, Przewalski's wild horse, Rock hyrax, Aardvark, Spotted gar, Harbor seal, Asian arowana, Lion-tailed macaque, Maned wolf, Shetland pony, Western lowland gorilla, Mexican giant musk turtle, Mudpuppy, Grevy's zebra, Sumatran tiger, Mexican wolf, Spectacled bear, Boat-billed heron, Cinerous vulture, Andean condor, Black spur-winged goose, Giant Columbian apple snail, Mombasa golden starburst tarantula, Addax, Wild boar, Masai lion, Polar bear, Alpaca, Blesbok, Partula snail, Greater rhea, Rockhopper penguin, Taveta golden weaver, Snowy egret, Guanaco, Bactrian camel, Nilgai, Scimitar-horned oryx, Siamese crocodile, Spectacled langur, Grizzly bear, Cape clawless otter, Talapoin monkey, Ring-tailed lemur, Three-toed amphiuma, Solomon Islands leaf frog, Hourglass treefrog, Green spotted puffer, Archerfish, Black rhinoceros, Anna's hummingbird, Asian fairy-bluebird, Scarlet macaw, Barn owl, Chilean flamingo, Grant's zebra, Arctic fox, Trumpeter swan, Red-crowned crane, Smew, Red-rump baboon tarantula, South African crested porcupine, Black-tailed prairie dog, White-handed gibbon, Coati, Aruba Island rattlesnake, Mexican beaded lizard, Julia butterfly, Red seminoles ramshorn snail, Capybara, Hippopotamus, Reticulated giraffe, California sea lion, Lake sturgeon, American eel, North American otter, South American tapir, Raccoon butterflyfish, Australian lungfish, Domestic cattle, Saudi goitered gazelle, Slender-horned gazelle, Reticulate gila monster, Oriente knight anole, Turnip-tailed gecko, Tentacled snake, Birchir, Dwarf stringray, Black-chinned hummingbird, Magpie goose, Violet plantain-eater, Inca tern, Barnacle goose, Glossy ibis, Bald eagle, Pondicherry vulture, Siberian white crane, Stanley crane, Siberian tiger, domestic goat, Collared peccary, Golden spider monkey, Thorold's deer, African lion, Mexican cascillan, Squirrel treefrog,

## DETROIT ZOOLOGICAL INSTITUTE

Puerto Rican crested toad, kokoi dart-poison frog, Waxy treefrog, African clawed frog, Scheltopusik, Natal midlands dwarf chameleon, Henkel's leaf-tail gecko, San Esreban Island chuckwalla, Bufflehead, Red coachwhip, Mangrove snake, Ball python, Yellow anaconda, Green tree python, Peach-throated monitor, Corn snake, Domestic rabbit, Vietnamese pot-bellied pig, Domestic sheep, Blue-and-yellow macaw, Goliath pinkfoot tarantula, Giant African millipede, Wild turkey, Bar-headed goose, Egyptian goose, Mexican red-legged tarantula, Common peafowl, Miniature donkey, Asian elephant, Dolphin-headed mormyrid, Colorado squawfish, Twig catfish, Pia thepa catfish, Blind cave characin, Alligator snapping turtle, Blanding's turtle, Big-headed turtle, Giant hill turtle, African pancake tortoise, Striped headstander, Shovelnose catfish, Electric eel, Red-breasted piranha, Madder seaperch, Walleye, Four-eyed fish, Sarus crane, Demoiselle crane, Gray-crowned crane, Secretary bird, Lappet-faced vulture, Hooded vulture, Sunbittern, Luzon bleeding-heart pigeon, Owl finch, Bali mynah, Sudan golden sparrow, Blue-gray tanager, Red-billed hornbill, Ostrich, Saddle-billed stork, Hamerkop, Boeseman's rainbowfish, Golden skiffia, Desert pupfish, Freshwater drum, Green bird wrasse, Pennant coralfish, Giant marine toad, Surinam toad, Cuban treefrog, Coqui frog, Green-and-black dart-poison frog, Panther chameleon, Mountain chameleon, Giant plated lizard, Madagascar spiny-tailed gecko, Matamata, Inland bearded dragon, Dwarf caiman, American alligator, South American snake-necked turtle, West African sideneck turtle, Round Island skink, Dumeril's ground boa, Emerald tree boa, Crocodile lizard, Jamaican boa, Casque-headed skink, Long-nosed vine snake, Cat-eyed snake, Black forest cobra, Northern copperhead, Burmese python, Horned sand viper, Eastern massasauga, Sri Lankan tree viper, Sonoran sidewinder, Eastern diamond rattlesnake, Brown newt, American toad, Blue-spotted salamander, Irish Dexter cow, African pygmy goat, Romney sheep, Jersey steer, Common blue bloom tarantula, Gambian spur-winged goose, Zebra butterfly, Costa's hummingbird, Domestic goose, Speckled mousebird, Snowy-headed robin-chat, Scarlet-crested sunbird, Yellow-billed cardinal, Spice finch, Red-eared firetail finch, Superb starling, Common crow, Boat-billed heron, Greater snow goose, Green iguana, Giant Texas millipede, Turkey vulture, Black vulture, American wigeon, Blue-winged teal, Mandrian duck, Lesser White-fronted goose, Pacific white-fronted goose, African spoonbill, Roseate spoonbill, Scarlet ibis, Black-necked swan, White-faced whistling duck, Ruppell's griffon vulture, Old World comb duck, Andean goose, South African black duck, Lesser scaup, Laysan teal, Hottentot teal, African pygmy goose, Indian black vulture, Blue penguin, Costa Rican zebra tarantula, Brook stickleback, Texas rat snake, Eastern fox snake, Desert monitor, Blue-tailed monitor, Prehensile-tailed skink, Frilled lizard, Axoloti, Curlicue anemone...

ETC. ETC. ETC.



# *The North American Crisis Management Survey*

*By William K. Baker, Jr., Zoologist  
1209 Tom Temple Dr., Lufkin, TX 75904-5560*

*Patricia M. Hainley, Zoo Keeper  
Ellen Trout Zoo, Lufkin, TX 75904*

*Kermit W. Seubert, Zoo Keeper  
Birmingham Zoo, Birmingham, AL 35223*

## **Introduction**

In today's modern zoological facilities the potential for a crisis management situation is an ever-present concern when managing captive zoological specimens. This has made the preparation for and response to the crisis management situation an important facet of the operation and management of zoological institutions and aquariums. As a result, facilities have developed contingency plans that reflect a balance between the needs of management, staff, and the specimens. This is no easy task, as the priorities of each group are different and may conflict with the interests of another group. Yet, to their credit, facilities overcome this and develop comprehensive strategies for reacting to a crisis situation. This survey is an attempt to provide a statistical overview of how zoological facilities in North America prepare, train, and respond to crisis management situations.

## **Methods**

The survey packet was composed of a cover letter, a four-page questionnaire that incorporated 38 questions, and a SASE. Survey packets were sent only to AZA-accredited institutions, aquariums, and related organizations located in North America. Respondents were guaranteed anonymity in publishing due to the sensitive nature of the data. If a major discrepancy was noted on a survey response, the respondent was contacted by telephone and given the opportunity to clarify or amend their response. This survey was independently designed and funded by the authors for the purpose of studying crisis management in zoological facilities.

Whenever possible survey questions were designed to reflect that management often utilizes more than one method or technique to address a problem or situation. When respondents provided specific answers to the Other category, these answers were identified and included in the results; while unspecified Other category answers were left under Other in the results. Data analysis was performed on a Microsoft Access 2.0 Relational Database using an Os-2 Warp Operating System on a 386/40 MHz CPU with 8M RAM.

**General Results**

Total number of surveys sent	187
Abstentions	2
Damaged beyond recognition in return transit	1
Total number of surveys received	79
Percentage of response	42.25%

**Survey Results**

Note: Numbers in brackets indicate facility responses and percentages indicate the statistical response. Multiple field questions indicate and reflect that more than one choice was possible.

**Crisis Management Survey**

Does your facility have an Emergency Response Team or Crisis Management Team?

[55]	Yes	69.62%
[24]	No	30.38%
[ 0]	N/A	0.00%

Does your facility have an emergency procedure for escaped animals?

[75]	Yes	94.94%
[ 3]	No	3.80%
[ 1]	N/A	1.26%

Does your facility have an emergency procedure for escaped dangerous animals?

[69]	Yes	87.34%
[ 9]	No	11.39%
[ 1]	N/A	1.26%

Does your facility have an emergency procedure for natural disasters?

[68]	Yes	86.07%
[11]	No	13.92%
[ 0]	N/A	0.00%

Does your facility have an emergency procedure for incidents that occur after hours?

[67]	Yes	84.81%
[12]	No	15.19%
[ 0]	N/A	0.00%



Does your facility have an escaped animal protocol agreement with your local law enforcement?

[33]	Yes	41.77%
[44]	No	55.70%
[ 2]	N/A	2.53%

Does your facility maintain emergency capture and restraint equipment in the event on an animal escape?

[75]	Yes	94.94%
[ 4]	No	5.06%
[ 0]	N/A	0.00%

Does your facility maintain emergency first aid and trauma equipment kits for use in the event of staff injury?

[72]	Yes	91.14%
[ 7]	No	8.86%
[ 0]	N/A	0.00%

Does your facility maintain emergency support equipment in the event normal operations were disrupted?

[65]	Yes	82.28%
[14]	No	17.72%
[ 0]	N/A	0.00%

Does your facility maintain emergency first aid and trauma equipment kits for zoological specimens?

[66]	Yes	83.54%
[13]	No	16.45%
[ 0]	N/A	0.00%

How is your staff contacted in an emergency situation?

[65]	Radio	82.28%	[ 3]	Horn	3.80%
[57]	Telephone	72.15%	[ 1]	Intercom	1.26%
[42]	Pager	53.16%	[ 1]	Media	1.26%
[31]	Cellular Phone	39.24%	[ 1]	Strobe Light	1.26%
[30]	Public Address	37.97%	[ 1]	Seucephone	1.26%
[27]	Alarm	34.18%	[ 1]	Other	1.26%
[ 5]	Siren	6.33%	[ 0]	N/A	0.00%

Does your facility have an alternative means of contacting staff after hours in an emergency situation?

[70]	Telephone	88.61%	[ 1]	Media	1.26%
[47]	Pager	59.49%	[ 1]	LE Dispatch*	1.26%
[23]	Cellular Phone	29.11%	[ 1]	Other	1.26%
[14]	Radio	17.72%	[ 1]	N/A	1.26%

\*LE Dispatch - Law Enforcement Dispatch

Who is in charge in an emergency situation?

[56]	Most senior staff member on the scene	70.89%
[22]	Chain of Command	27.85%
[12]	Emergency Response Team Leader	15.19%
[ 2]	Situational	2.53%
[ 1]	Security Manager	1.26%
[ 1]	Facility Manager	1.26%
[ 0]	Other	0.00%
[ 0]	N/A	0.00%

Note: 15 respondents use more than one method

Does your facility conduct scenarios or practice drills for a possible animal escape situation?

[49]	Yes	62.02%
[30]	No	37.97%
[ 0]	N/A	0.00%

How often does your facility conduct scenarios or practice drills for a possible animal escape?

[22]	None	27.85%	[ 3]	Random	3.80%
[20]	Quarterly	25.32%	[ 2]	Review Protocol	2.53%
[17]	Yearly	21.52%	[ 1]	Bi-Yearly	1.26%
[ 6]	Semi-Annually	7.59%	[ 1]	Post-Incident	1.26%
[ 6]	Monthly	7.59%	[ 1]	Other	1.26%
[ 5]	N/A	6.33%	[ 0]	Weekly	0.00%

What is the policy of your facility should a dangerous animal situation threaten human life?

[20]	Attempt to Distract	25.32%
[35]	Attempt to Contain	44.30%
[60]	Destroy/Euthanize	75.95%
[ 1]	Other	1.26%
[ 6]	N/A	7.59%

[10]	2-Stage Response	Contain/Destroy	12.66%
[17]	3-Stage Response	Distract/Contain/Destroy	21.52%

Note: Numerous respondents indicated the above choices and this additional data is included to reflect this.

What is the policy of your facility should a dangerous animal attempt to leave the grounds of your facility?

[14]	Attempt to Distract	17.72%
[41]	Attempt to Contain	51.90%
[53]	Destroy/Euthanize	67.09%
[ 0]	Other	0.00%
[10]	N/A	12.66%

[13]	2-Stage Response	Contain/Destroy	16.45%
[12]	3-Stage Response	Distract/Contain/Destroy	15.19%

Note: Numerous respondents indicated the above choices and this additional data is included to reflect this.

Has your facility ever had an animal escape?

[61]	Yes	77.21%
[18]	No	22.78%
[ 0]	N/A	0.00%

If your facility has had an animal escape, would you classify the escaped specimen(s) and provide the number of applicable escape(s) for each classification.

(e.g., One Siberian Tiger escapes. = [X] Dangerous 1 )

	Type of Escape	Reported Escapes	Total # Escapes	Sample Mean	Standard Deviation
[49]	Non-threatening	62.02%	208	2.63	±5.43
[23]	Threatening	29.11%	44	0.55	±1.15
[16]	Dangerous	20.25%	34	0.43	±1.37

Has your facility ever had a member of your staff injured or killed due to human-animal interaction?

[55]	Yes	69.62%
[24]	No	30.38%
[ 0]	N/A	0.00%



Has your facility ever had a member of the public injured or killed due to human-animal interaction?

[22]	Yes	27.85%
[57]	No	72.15%
[ 0]	N/A	0.00%

Has your facility ever had a zoological specimen injured or killed due to human-animal interaction with a member of the public?

[19]	Yes	24.05%
[60]	No	75.95%
[ 0]	N/A	0.00%

Has your facility ever had a zoological specimen injured or killed due to feral animal interaction?

[50]	Yes	63.29%
[29]	No	36.71%
[ 0]	N/A	0.00%

Has your facility ever had a zoological specimen injured or killed due to a natural disaster?

[16]	Yes	20.25%
[63]	No	79.75%
[ 0]	N/A	0.00%

Has your facility ever had a zoological specimen injured or killed due to a man-made disaster?

[ 9]	Yes	11.39%
[70]	No	88.61%
[ 0]	N/A	0.00%

Does your facility maintain firearms on site for dangerous animal escape situations?

[58]	Yes	73.42%
[20]	No	25.32%
[ 1]	N/A	1.26%

Has your facility ever had to use firearms kept on site for a dangerous animal escape situation?

[14]	Yes	17.72%
[60]	No	75.95%
[ 5]	N/A	6.33%

Has your facility ever had to discharge firearms kept on site during a dangerous animal situation?

[13]	Yes	16.46%
[60]	No	75.95%
[ 6]	N/A	7.59%

What types of firearms does your facility keep on site, (number, caliber, and action)? [e.g, (1) 375 H&H bolt-action rifle]

Firearm Type	Firearm Action	Firearm Chambering	Firearm Total
Pistol	Unknown	Unknown	Unknown
"	Revolver	38 Spl.	2
"	Revolver	357 Mag.	5
"	Revolver	44 Mag.	1
"	Semi-Auto	9mm Luger/9x19	3
Rifle	Unknown	Unknown	Unknown
"	Bolt	22 L.R.	10
"	Bolt	7mm Rem. Mag.	2
"	Bolt	308 Win./7.62 NATO	4
"	Bolt	30-06 Spr./30 US	19
"	Bolt	300 Win. Mag.	1
"	Bolt	338 Win. Mag.	2
"	Bolt	357 Mag.	1
"	Bolt	375 H&H Mag.	7
"	Bolt	378 Wby. Mag.	1
"	Bolt	412 Rem. Mag.	1
"	Bolt	458 Win. Mag.	4
"	Lever	30-30 Win.	5
"	Lever	348 Win.	1
"	Lever	45-70 Govt.	1
"	Pump	22 L.R.	1
"	Semi-Auto	22 L.R.	1
"	Semi-Auto	22 Mag.	1
"	Semi-Auto	223 Rem./5.56 NATO	2
"	Semi-Auto	30-30 Win.	2
"	Semi-Auto	30-06 Spr./30 US	1
"	Semi-Auto	44 Mag.	1
Shotgun	Unknown	Unknown	1
"	Unknown	12 Gauge	14
"	Pump	12 Gauge	52
"	Pump	20 Gauge	1
"	Pump	410 Gauge	1
"	Semi-Auto	12 Gauge (3" Mag.)	5
"	Semi-Auto	20 Gauge	1
"	Break	12 Gauge	8



Does your facility have a training program for the use of firearms?

[49]	Yes	62.02%
[23]	No	29.11%
[ 7]	N/A	8.86%

How often do you practice with firearms?

[24]	N/A	30.38%	[ 3]	Random	3.80%
[22]	Yearly	27.85%	[ 2]	Under Development	2.53%
[17]	Quarterly	21.52%	[ 2]	Other	2.53%
[ 4]	Semi-Annual	5.06%	[ 1]	Weekly	1.26%
[ 4]	Monthly	5.06%			

Where do you practice with firearms?

[33]	Law Enforcement Range	41.77%	[ 4]	Other	5.06%
[24]	N/A	30.38%	[ 1]	City Range	1.26%
[16]	Public Range	20.25%	[ 1]	Military Range	1.26%
[ 6]	Private Range	7.59%			

Does a law enforcement agency assist you in your firearms training?

[35]	Yes (if yes, see next list)	44.30%			
[21]	No	26.58%			
[23]	N/A	29.11%			
[29]	Local	36.71%	[ 1]	Private	1.26%
[ 2]	County	2.53%	[ 1]	Other	1.26%
[ 1]	Federal	1.26%	[ 0]	State	0.00%
[ 1]	Military	1.26%	[ 0]	N/A	0.00%

How many staff members are designated shooters or allowed access to firearms kept on-site in an emergency situation?

[ 5]	1-2	6.33%	[10]	2-4	12.66%	[21]	4-6	26.58%
[10]	6-8	12.66%	[ 4]	8-10	5.06%	[ 1]	10-12	1.26%
[ 3]	12-14	3.80%	[ 3]	14-16	3.80%	[ 0]	16-18	0.00%
[ 0]	18-20	0.00%	[ 1]	20-22	1.26%	[ 0]	22-24	0.00%
[21]	N/A	26.58%						

What qualification standards does your facility set for access and use of firearms?

[37]	In-house Training	46.83%
[23]	Annual Qualification	29.11%
[21]	N/A	26.58%
[17]	Marksmanship	21.52%
[16]	Determined by Instructor	20.25%
[16]	Prior Knowledge	20.25%
[ 1]	Outside Training	1.26%
[ 1]	Review Protocol	1.26%
[ 0]	None	0.00%
[ 0]	Other	0.00%

Does your facility provide First Aid & CPR training for staff members?

[66]	Yes	83.54%
[13]	No	16.45%
[ 0]	N/A	0.00%

Are the designated shooters trained in CPR & First Aid?

[48]	Yes	60.76%
[12]	No	15.19%
[19]	N/A	24.05%

Would your facility be interested if a course was offered in crisis management, emergency procedures, and firearms training that was specific to the needs of a zoological facility?

[49]	Yes	62.02%
[30]	No	37.97%
[ 0]	N/A	0.00%

**Discussion**

In conducting this survey it became obvious that most of the responding facilities have given a significant amount of time and effort in preparation for crisis management situations. This has resulted in the development of an infrastructure within the facilities that utilizes management procedures, equipment, and communications.

Yet, upon closer examination there was a trend that deserves commentary. In certain instances there exists a notable difference between infrastructure and training. Examples of this would be: While facilities have emergency procedures for escaped animals (94.94%), escaped dangerous animals (87.34%), and maintain capture and restraint equipment in the event of an animal escape (94.94%), fewer facilities actually conduct scenarios or practice drills for a possible animal escape (62.02%). It should also be noted that a considerable number of



facilities do not conduct scenarios or practice drills at all (37.97%). These differences become relevant when compared to the facilities that have reported animal escapes (77.21%).

Another example of this trend is that a significant number of facilities maintain firearms on site for dangerous animal escape situations (73.42%), while fewer facilities have a training program for the use of firearms (62.02%). There is also a notable difference between the facilities that provide CPR and First Aid training to their staff members (83.54%) and the designated shooters who are trained in CPR and First Aid (60.76%). This is noteworthy when compared to the facilities that have reported a member of their staff has been injured or killed due to human-animal interaction (69.62%). This would seem to indicate that a need exists for first aid training for all staff members. These observations are not intended as criticism; however, they are intended to indicate areas that could be addressed to improve the effectiveness of the response to a crisis situation.

One other area of the survey deserves some discussion. The question on who is in charge in an emergency situation yielded 15 respondents that have more than one method of determining who is in charge. While in most situations the use of more than one technique to respond to a crisis allows flexibility, this is not one of those situations. It is the opinion of the authors that it is essential that the person in charge of the crisis response should be clearly defined. The reason for this is that a crisis is a complex and sometimes confusing situation that requires clearly defined leadership to prevent a failure in communication and the subsequent response.

## **Comments**

Numerous respondents took the time to write in additional comments on the survey that were not directly part of the data. In an effort to provide as much information as possible, these comments are included. Two institutions indicated that they had chosen not to use lethal force in an animal escape situation. One institution indicated that firearms access is controlled by keeping a key behind glass for the general staff and giving direct key access to designated personnel. One institution has an EMT as part of their Security Department and is on grounds 16 hours a day. Another institution uses a code phrase in the local media to notify staff that a crisis situation exists at their facility.

The last question in the survey on facility interest in a crisis management course is noteworthy as it provoked a considerable number of written comments and a few telephone calls. These comments ran across the spectrum expressing support, limiting factors, and also questioning motivation. The last point, motivation, deserves some explanation. This question was included to indicate interest in a crisis management course for zoological professionals in the hope that a management school, similar to those already in place, might one day be developed. With a positive response of 62.02% to the question, the interest is present.

## Conclusion

The zoological profession is unique in that it provides us with the opportunity to work, study, and perform research in close proximity to captive animals. These opportunities allow for captive propagation of endangered species, conservation, and environmental education. Yet, it is also this proximity that conversely provides an inherent safety risk when managing captive animal populations. For this reason there will always be a need to prepare for the crisis management situation. However, the preparation should include training and practice that is a practical application of the emergency protocol that is instituted by a zoological facility. Protocol should be the beginning of the crisis response, not the end of it.

## Acknowledgements

The authors would like to thank all of the facilities that responded to the survey; without your support this research could not have taken place. To the institutions and their staff that sent letters of encouragement, words can't describe how important they were to us. To all of the individuals who took the time to write in comments on the survey and questions, they are being integrated into the next survey model; it's been a learning experience for us too.

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*(About the Authors: Since 1985, Bill has been active in the fields of science, zoology, and wildlife management. His education and experience include a B.S. in Wildlife Management and post-graduate studies in Zoology, Lab and Museum Assistant, Shoot Team Leader, ERT-member, Senior Keeper and Large Mammal Keeper at various AZA facilities. His area of research is crisis management in zoological institutions, which draws upon practical experience and training as a Rescue Diver, Hunter Safety Instructor, NRA Firearms Instructor, and Red Cross CPR/ First Aid Instructor. He is currently on research sabbatical studying crisis management. Patti's education and experience includes a B.S. in Psychology and extensive experience as an animal trainer and Zoo Keeper at private and AZA facilities. Her animal training experience includes cetaceans, pinnipeds, and pachyderms. She is currently working at the Ellen Trout Zoo. Kermit's education and experience include a B.S. in Biology and Zoology and extensive experience at AZA facilities. He has been a Shoot Team Member, Large Mammal Keeper, and specialized in free and protected contact for pachyderms as a trainer. He is currently pursuing a degree in veterinary medicine.)*





# Book Review

## In The Country of Gazelles

By Fritz P. Walther

Indiana University Press (1995)

601 North Morton St., Bloomington, IN 47404-3797

Bloomington, Indiana

Hardback, 162 pgs. Price: \$24.95

*Review by Harland Deckert  
Docent, Los Angeles Zoo  
Member, L. A. Zoo and AAZK, Inc.  
Los Angeles, CA*

The author, born and raised in Dresden, Germany and a teacher at Texas A&M University for 14 years, spent 30 years on and off studying gazelles in and around Tanzania National Park in East Africa.

The bulk of his studies were of the Thomson's gazelle, (*Gazella thomsoni*) and the Grant's gazelle, (*Gazella (Nunger) granti*). In his last chapter, he also describes the activities of the fringe-eared oryx, (*Oryx beisa callotis*) which is closely related to the highly endangered, but recovering Arabian oryx now being bred in a number of zoos in the United States.

A very thorough coverage of the behaviors and adaptations of the two species of gazelle is included in the book. The author goes into considerable detail about the territorial, breeding, and migrating habits of the animals. He discusses their trials and tribulations as prey for many carnivores as well as their means for survival (RUN, RUN, RUN).

Very interesting descriptions of how the females protect their very young calves are given. Some use the "lying-out" method, where the calf stays motionless in the underbrush. Others depend upon their calves being able to run at a very early age.

Males are territorial, but females come and go into the various male territories. The males try to keep as many females in their harems by herding them back in when they try to leave the territory. There is fighting among males over their territories and harems. Real damage to the males is seldom seen. Most of the fighting is ritual, with the dominant male (usually the largest) chasing off the other.

Mr. Walther uses an interesting technique for his narration. He picks individual animals, gives them names, then follows their activities over a number of years. This play makes the book interesting and a pleasure to read. Actually, once started, this reviewer found it hard to put down.



The illustrations (drawings and photos) are done by the author. His drawings are particularly excellent. They are placed strategically in close proximity to the explanatory text so that the reader can readily visualize the actions being described.

This book will be of particular interest to gazelle and antelope keepers, but will also be valuable to any zoo staff members or volunteers.

**Phyllis, Phallus, Genghis Cohen and other creatures I have known**

by Fredric L. Frye DVM

Krieger Publishing Company

P.O. Box 9542, Melbourne, FL 32902-9542

Reprint Edition 1994; copyright 1984

155 pages Cloth Price: \$16.50

*Review by Alan Baker*

*Sacramento Zoo, Sacramento, CA*

*Phyllis, Phallus, Genghis Cohen* was originally published in 1984. This book is a reprint with some added material. Most reptile keepers will be familiar with Dr. Frye's more scholarly work such as *Biomedical and Surgical Aspects of Captive Reptile Husbandry*.

*Phyllis, Phallus, Genghis Cohen* is a different type of book entirely. It is a collection of stories and anecdotes that Dr. Frye experienced as a youth and primarily while he was a practicing Veterinarian at the Berkeley Dog & Cat Hospital in California.

Dr. Frye has stories to tell about all kinds of animals, particularly exotic pets and reptiles. One chapter details his collection trip for Indus River dolphins for Steinhart Aquarium.

This book was enjoyable and fun to read. Many of the stories were strikingly similar to calls from the public we receive at the zoo. This book's easy reading style will make it humorous reading for anyone interested in animals or veterinary work.

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# *Legislative Update*

*Compiled by Georgann Johnston  
Legislative Advisor  
Sacramento, CA*



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## **Red Legged Frog First Species To Be Listed By USFWS As Threatened Following Lifting Of The Moratorium**

The frog made famous by Mark Twain as the “celebrated jumping frog of Calaveras County” has won notoriety again — this time as the first species to be listed as threatened following a lifting of the Congressionally imposed moratorium on designating endangered species. Mollie Beattie, Director of the Fish and Wildlife Service stated that many agencies and organizations in California have already taken this species into account in their planning efforts. Conservation measures for the frog will be made easier by the species’ designation as “threatened”, a category only slightly less serious than “endangered”.

This amphibian is the largest native frog in the western United States, ranging from 1.5 to 5 inches in length. Its habitat is primarily wetlands and streams with deep water pools close to dense stands of overhanging vegetation. When Mark Twain wrote about the frog over 100 years ago it was quite common throughout California but has disappeared from 70 percent of its habitat today. The population decline has been attributed to reservoir construction, exotic predators, grazing, drought, and the fact that the frog was harvested for food around the turn of the century.

In 1992, prior to the moratorium on the listing of endangered and threatened species imposed by Congress, the red-legged frog was first proposed as an endangered species. Following a review of its status and significant public comment and surveys, that proposal was downgraded to threatened in 1994. The frog then had to wait two years for actual listing until President Clinton lifted the moratorium as part of the 1996 omnibus appropriations act.

*Source: USFWS News Release 20 May 1996; Sierra Club Action Alert #208, “A Leap to Survival”, 20 May 1996*

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## **Comments Sought On Amending Waterfowl Baiting Regulations**

The U.S. Fish and Wildlife Service is seeking public comment on new and modified regulations which prohibit hunting over natural vegetation which has been “mowed or otherwise artificially manipulated to attract waterfowl.” Commonly referred to as “illegal baiting”, hunters and landowners frequently manipulate moist-soil areas to make them more attractive to overflying geese and ducks.



The USFWS has identified three issues in the proposed regulations including: (1) do current regulations impose too much of a burden on landowners without any economic incentive to retain waterfowl habitat; (2) will changing the regulations actually increase or decrease waterfowl populations; and (3) will there be additional fiscal impact on law enforcement agencies because of the changes.

The primary proponents of change include hunting and sporting interests. The Service is soliciting comments from wildlife biologists and others with an interest or expertise in the area of waterfowl management who can advise the Service of their views on the need for reform.

Copies of the proposed changes can be obtained from the Director FWS/NAWWO, U.S. Fish and Wildlife Service, 110 ARLSQ, 1849 C Street, N.W., Washington, D.C. 20240.

*Source: U.S. Fish and Wildlife Service News Release, 21 May 1996*

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## **Wetlands Destruction May Doom Cape Sable Sparrow**

The number of endangered Cape Sable sparrows dropped dramatically from over 6,000 sparrows to less than 2,500 in the past three years according to the Miami Herald. The South Florida Water Management District and the Army Corps of Engineers has flooded much of the remaining habitat of the sparrow. Craig Johnson of the US Fish & Wildlife Service says, "This bird is the proverbial canary in the mine. Its survival is closely tied to those wet prairies around the edges of the Everglades." NRDC intends to sue unless the agencies take emergency measures to protect the sparrow.

*Source: GREENLINES #136 6-3-96 / Grassroots Environmental Network*

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## **Second Marine Mammal Threatened With Extinction**

The first extinction of a cetacean species and only the second marine mammal to disappear from the west coast since the Steller sea cow could occur if the vaquita disappears from Mexico's Sea of Cortez, reports the Sacramento Bee. An article in the Bee says that according to "several new scientific reports" the species is "on the verge of extinction, a victim of commercial gill net fishing." Mexico created a reserve in part to protect the vaquita but "many contend that the reserve is a sanctuary in name only," says the Bee. Among the steps being discussed to protect the species is a US embargo of Mexican seafood, the article says. "If the US embargoed fishery imports from the northern sea because of the plight of the vaquita," the Bee quotes an unnamed scientist, "Mexico would infuse millions of dollars into the area and solve the problem right away."

*Source: GREENLINES #140 6-7-96 / Grassroots Environmental Network*



# .....SHOULD YOU CHOOSE TO ACCEPT IT, YOUR ASSIGNMENT IS.....

In preparation for the upcoming Enrichment Workshop at the National AAZK Conference in Detroit, the AAZK Enrichment Committee would like to put together a booklet of enrichment ideas currently being used at your institutions.

We are anticipating covering all species, so include as many per institution as you want.

On standard size (8 1/2 x 11 inch) paper include (print or type all information):

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**Materials needed**

**Dimensions**

**Drawings**

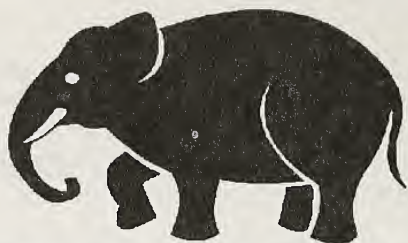
**Your Name, Institution & Phone Number**

To have your enrichment item included in this booklet, please send it **by 31 August 1996** to: Dianna Frisch, AAZK Enrichment Committee Chair, Columbus Zoo, 9990 Riverside Dr., P.O. Box 400, Powell, OH 43065; (614) 645-3515.

**The AAZK Enrichment Committee would like to make these booklets available at the Conference, one per institution representative.**

*(Note: Be certain to obtain permission, if required, from your institution before submitting enrichment ideas for publication in this booklet.)*

# Chapter News Notes



## Pueblo Zoo AAZK Chapter

Newly elected officers for the Pueblo Zoo AAZK Chapter (Pueblo, CO) are:

President.....Dale Berryman  
Vice-President.....Bob Hicks  
Secretary.....Audrey Adams  
Treasurer.....Melanie Haynes  
Chapter Liaison.....Jason Garnett

## Dallas Zoo AAZK Chapter

Our Chapter held our most successful Bowling for Rhinos event on 16 May. In addition to bowling, we held our third silent auction. New to our event this year were original design T-shirts - the black design of a mother and calf black rhino is screened onto a 100%

white cotton T-shirt (see inset). Due to the generosity of the artist, Janie Coleman, and the T-shirt underwriter, Rhino Linings of North Dallas, all proceeds from the sale of the shirts will be contributed to Bowling for Rhinos.

We still have T-shirts available for sale at \$15.00 each (includes s&h) in adult sizes, S, M, and L; a few XXL are also available - on a first come, first served basis. Any AAZK Chapters wishing to exchange T-shirts for auctions, raffles, etc. are welcome to contact: Lisa Fitzgerald, Dallas AAZK, 621 E. Clarendon, Dallas, TX 75203. Fax at (214) 670-6717; e-mail [cybennett@aol.com](mailto:cybennett@aol.com).

—Lisa Fitzgerald





*Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks / AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing date for positions available and when setting these dates keep in mind that because of bulk-mail, most readers do not receive the AKF until the middle of the month or later. There is no charge for this service and phone-in or fax listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is (913) 273-1980.*

**EDUCATION CURATOR**...Responsible for the development and implementation of all education programs. Assists in the production of promotional materials including newsletters, visitor information, and educational exhibits. Must be able to supervise staff, communicate effectively and be team oriented. Assists in planning for educational aspects of all new exhibits. Bachelor's degree (master's preferred) in ornithology, biology, education or a closely related field and four years experience in education (zoo, aviary or natural history setting preferred) including one year in supervisory position. Bird handling experience helpful. Excellent communication and writing skills a must. Salary commensurate with experience. Send letter, resumé and three (3) references and salary history to: Maralyn Cragun, Executive Director, Tracy Aviary, 589 East 1300 South, Salt Lake City, UT 84105.

**ANIMAL KEEPER/MAMMALS**...each candidate must have one year of paid experience in the care and handling of a variety of animals, excluding pets; or six (6) months experience in the care and handling of animals in a zoological institution; or have a Bachelor's degree from an accredited college or university in biology, zoology, animal science or veterinary technology. Under the direct supervision of a Sr. Keeper and/or Curator. Send resumé to: Personnel Dept., Baltimore Zoo, Druid Hill Park, Baltimore, MD 21217.

**HEAD KEEPER**...must have a minimum of two (2) years paid experience and the ability to deal with a diverse collection of animals. Growing zoo only one mile from Gulf of Mexico. Approximately 300 animals - everything from alligators to zebras. Prefer someone with supervisory experience. Responsible for daily care, feeding, habitat upkeep, breeding programs, record keeping, training of keeper staff, coordination with staff veterinarians, and interfacing with public. Should have the ability to set up computer record keeping program. Very competitive salary that is commensurate with experience. Send letter, resumé and references to: Troy A. Peterson, Director, Zooland Animal Park, P.O. Box 2589, Gulf Shores, AL 36547. Position open until filled.

**ZOOKEEPER/ASIAN DOMAIN**...requires good written/oral communication skills and the ability to work effectively in a team-oriented environment. Associate's degree in biology or related field and one year's experience preferred or equivalent combination of training/experience in the care of mammals, preferably elephants, carnivores and ungulates. Will work elephants in a free-contact program. Salary Commensurate with experience. Send resumé to: Rhonda Votino, Assistant Curator of Mammals/Asian Domain, Audubon Institute, P.O. Box 4327, New Orleans, LA 70178. EOE

**ANIMAL CARE KEEPER**...must have a minimum of two (2) full years of practical experience with captive exotics in a professional zoo setting. The successful candidate will be exposed to a diverse animal collection within a small progressive zoo environment. It is important the applicant be proactive with a positive work attitude. Salary \$10,920.00 - \$13,500.00 with added benefits. Send resumé with references **by 1 August 1996** to: Dale J. Bakken, Director, Heritage Zoo, 2103 West Stolley Park Road, Grand Island, NE 68801.

**KANGAROO KEEPER**...(AZA Related Organization) requires five (5) year's experience in management/care of zoological animals, emphasis on marsupials. Full-time duties include responsibility for all aspects of animal care, ranch operations. Must be physically strong. Competitive salary. Copy of full job description available to serious candidates, including possible relocation to new ranch in San Antonio, TX. Send resumé (including salary history) to: Nelson's Twin Oaks Farm, 13305 Bethany Rd., Alpharetta, GA 30201. FAX (770) 475-6001, or e-mail: Roofarm@aol.com.



**BAT KEEPER.** Requires one year's experience working with captive animals. Responsible for daily maintenance/care of the Old World fruit bat collection, including providing assistance to researchers, giving medication, giving presentations on bats, and record keeping. Education may be substituted for part of experience. Salary \$6-8/hr. with the added benefit of a retirement plan/life insurance policy. Applicants must have TB test and updated tetanus vaccination prior to hiring. Send resumé/ references by **22 July 1996** to: Dana LeBlanc, Animal Supervisor, The Lubee Foundation, Inc., 1309 NW 192nd Ave., Gainesville, FL 32609. EOE. (no phone calls).

**SENIOR WILD ANIMAL KEEPER**...requires a degree in animal science and 3+ year's experience caring for mammals, birds, and/or reptiles in a zoo setting. Will be responsible for animal care and exhibit maintenance at the recently renovated Prospect Park Wildlife Center in Brooklyn, NY. Salary \$27,635 to start, rising to \$31,366 after one year. Benefits include 3 weeks vacation plus health, dental, and retirement plans. Send resumé with cover letter to: John Fairbairn, Human Resources, Wildlife Conservation Society, 2300 Southern Blvd., Bronx, NY 10460. (718) 220-5119 Fax - (718) 220-2464.

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## Information Please

We are looking for information on enclosures for cougars (*Felis concolor*). We are especially interested in shifts, wire, watering systems, and feeding systems. This exhibit will house 0.2 cougars, both are completely declawed. Information on anything (furniture, pools, etc.) that has worked well for your cougars would be appreciated. Please send information to: Carin peterson, c/o Austin Zoo, P.O. Box 91808, Austin, TX 78709-1808; Fax - (512) 288-3972, or e-mail: austinzu@aol.com.

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**August 1996**

**Vol. 23, No. 8**

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**Zoo Infant Development Project** - Teri Maas-Anger/Maggie Liguori, Philadelphia Zoo (Birds/Nonpasserines); Jennifer Hackshaw, Lowry Park Zoo and Suzanne Chacon, Costa Rica (Birds/passerines); Jeanne Stevens, Newark Museum

Mini-Zoo (Reptiles); Linelle Lone, Denver Zoo (Amphibians)

**Diet Notebook, Mammals, Vol. II** - Susan Bunn Spencer, Rockford, MI

**Incubation Notebook Project** - Scott Tidmus, Sedgewick County Zoo, Wichita, KS

**Exhibit Design Resource Notebook** - Mike Demlong, The Phoenix Zoo, Phoenix, AZ



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## About the Cover.....

This month's cover features a Hercules beetle (*Dynastes hercules*) which belongs to the family Scarabaeidae in the sub-order of beetles known as Polyphaga. One of the world's largest beetles, this species reaches a length of 16cm (6.8 in.). The males fight using the spiny, hairy grip of horns extending from the head and thorax, the ultimate goal being to slam the rival onto his back. This cover shows the species at approximately true-to-life scale. The artwork was done by Mike Demlong of The Phoenix Zoo. Thanks, Mike!

## Information for Contributors

*Animal Keepers' Forum* publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Articles may be submitted on disk by arrangement with the Editor. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy finish black and white photos **only are accepted**. Color slides should be converted to black and white prints (minimum size 3" x 5" [8cm x 14cm] ) before submission. Clearly marked captions should accompany photos. Please list photo credit on back of photo.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for *AKF*. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

**Deadline for each regular issue is the 10th of the preceding month. Dedicated issues may have separate deadline dates and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the *AKF* staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$3.00 each.

# *Message from the President*

Greetings from the Lone Star State!

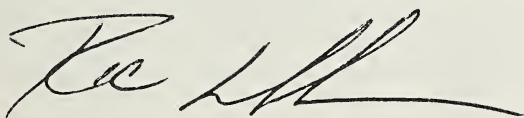
In little zoo keepers' dreams, drains flow smoothly in one direction, shift doors close without getting hung up, locks never need oiling and every animal is enriched. Many of these will remain dreams, while others can come true. Sometimes you just have to look for the answers. Well, an easy place to find answers to your dreams and compare nightmares would be at a national conference. Yes, it is just around the corner. The 23rd National AAZK Conference in Detroit, MI is quickly drawing near. The National Conference offers a great opportunity to meet zoo professionals from all around the country. Paper sessions, poster presentations, workshops or hospitality room chat, the exchange of information is inevitable.

Conferences also mean the Annual Meeting of the Board of Directors of AAZK, Inc. Customarily, the AAZK Board conducts an executive session meeting the day before the conference officially begins. This year it will be on Saturday, 5 October. The executive session Board Meetings allow the Board members time to discuss and clarify all AAZK projects, the activities of the committees, the future of AAZK, its policies and the budget. As an AAZK member, this is your opportunity to express your concerns on matters that will direct the future of your Association. Please send your comments to any of your Board of Directors, the Administrative Office or to me directly. I will place them on the agenda for discussion.

The open Board Meeting, Committee and Project Meetings will be on Saturday, 6 October. Any interested members will have the opportunity for input at this time.

I look forward to seeing you in Detroit.

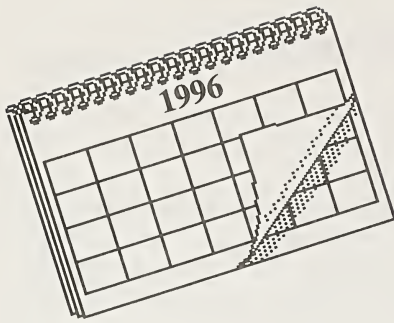
Respectfully,



Ric Urban, AAZK President  
Houston Zoological Gardens, Houston, TX







# Coming Events

**Association of Avian Veterinarians 1996 Conference** - August 27- September 1, 1996 in Tampa, FL. Meeting includes sessions on medicine, diagnostics, ratites, infectious diseases, environmental practice, etc. Also included will be practical application labs on surgical topics, parasitology, avicultural medicine. For more information contact the AAV Conference Office at (303) 756-8380.

**ZOOMANIA - 96 - Southeast Regional Docent Conference** - September 13-15, 1996 at Gulf Breeze, FL. Registration and hotel information available by contacting the Docent Council or Curator of Education at THE ZOO (904) 932-2229, ext. 27.

**12th Annual International ChimpanZoo Conference - Communication and Respect: A New Perspective of Hand Rearing Chimpanzees** - September 28 - October 2, 1996, hosted by the Sedgwick County Zoo, Wichita, KS. Opening address to be given by Dr. Terry Maple, Director Zoo Atlanta. Feature speakers to include: Doctors Jane Goodall, Kim Bard of Yerkes and Aleccia A. Lilly of LABS. Workshops will include: a new perspective for hand-rearing chimpanzees and primates without moms. For more information contact: Dr. Virginia Landau, Director of ChimpanZoo (520) 621-4785, 800 E. University Blvd., RM 308, Tucson, AZ 85721.

**Second Annual Red Panda SSP Keeper Training Workshop** - October 4-6, 1996 at Knoxville Zoological Gardens, Knoxville, TN. For further information and registration materials, contact Greta McMillan, Conservation Research Curator, P. O. Box 6040, Knoxville, TN 37914 - (423) 637-5331 ext. 380, fax (423) 637-1943, e-mail: knoxzoo@utkux.utk.edu

**Association of Zoological Horticulture International Conference** - October 4-12, 1996 in Greensboro, NC. For further information contact: Virginia Wall, North Carolina Zoological Park, 4401 Zoo Pkwy., Asheboro, NC 27203; (910) 879-7400.

**Association of Zoo Veterinary Technicians 16th Annual Conference** - October 29 - November 1, 1996 in Puerto Vallarta, Mexico. Will include sessions on reptile, avian, primate, exotic hoofstock and aquatic medicine, immobilization, hematology, clinical pathology, hospital techniques and case reports. There will also be a wet-lab. For more information contact: Jenni Jenkins, LVT, National Aquarium at Baltimore (410) 659-4256; fax (410) 576-1080. For membership information contact Lisa Kolbach, LVT at White Oak Conservation Center at (904) 225-3396.

## **AAZK Announces New Professional & Contributing Members**

Theresa M. Andrews, **Greenville Zoo (SC)**; Suzanne Pearson, **Zoo Atlanta (GA)**; Benny L. Dent, Timothy D. Jones, Eddie Holsey and Robert Myler, **Chehaw Wild Animal Park (GA)**; Jennifer Reddish, **Miami Metrozoo (FL)**; Donna J. Ladd, **Lion Country Safari (FL)**; Christy Freeland, **The Florida Aquarium (FL)**; Dan Haggerty, **Detroit Zoo (MI)**; Jacquelyn Fallon, **Minnesota Zoo (MN)**; M. Angela Andrewson, **Rolling Hills Refuge (KS)**; Boyd Ford, **Audubon Zoo (LA)**; Anne C. Ashley, **Tulsa Zoo (OK)**; Kris Becker, **El Paso Zoo (TX)**; Krishna Merkley, **Ross Park Zoo (ID)**; Joanne Milosevich, **The Living Desert (CA)**; Mary Rosolowich, **Honolulu Zoo (HI)**; and Melanie Gauthier, **Zoo de Granby, Inc., (Quebec)**.

### **Renewing Contributing Members**

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## Animal Behavior Concerns & Solutions

A Question and Answer Forum for the Zoo Professional

By Diana Guerrero

Independent Behavior Consultant, Ark Animals of California, San Diego, CA

### **CHIMPANZEE EVALUATION** (*Pan troglodytes*)

Zoo, Primate String

#### **QUESTION**

We currently house an unrepresented male common chimpanzee and have been unsuccessful in getting him to breed our females. It would be advantageous for us to attempt semen collection without the standard procedures for electroejaculation. Can you suggest any specific strategies to do this?

#### **BACKGROUND**

The male chimpanzee was a wild-caught individual and has been housed with a reproductively sound female for several years. Although he is a viable male he has not successfully bred with this female. He becomes highly aroused with new female keepers and will self-stimulate until ejaculation occurs. We would like to redirect this behavior for collection of semen since he is unrepresented in the captive gene pool.

The facility is temporary since a new primate exhibit is scheduled to be constructed shortly. The exhibit is small and consists of a small yard and several internal bedrooms. The bedrooms are small and open into a keeper area. Chimps are separated from each other and the walls facing the keeper area are small reinforced mesh.

#### **PROBLEM**

Animal has not bred current female. Part of the difficulty may be due to the amount of time spent housed with her which has been fairly long or perhaps there is some incompatibility. He has bred with another female but the offspring did not survive.

Access is difficult and based on his age, electroejaculation is a less than desired option. Training to an artificial vagina (AV) would be beneficial since he is currently unrepresented in the captive gene pool. He exhibits dominance displays and will masturbate when new human females are introduced. Although it may not be the case, part of the breeding difficulty may be from his focus on human females due to his early socialization.

## **ANIMAL PROFILE**

Upon further research it was discovered that the male (approximately 37 years of age) was imported in 1959 and reared in a household. He performed in numerous animal acts and television shows. He has a history of being highly aggressive to female humans and of extremely high intelligence for his species. This intelligence shows in his understanding of training parameters and "fooling" or distracting his conspecifics or his trainers.

## **OTHER NOTATIONS**

The male chimpanzee has recently had a change of companions. The interest shown in this female is high compared to the former. Grooming and other activity is taking place after a very short period of time and it is anticipated that breeding will occur.

In addition, urine samples are being collected from the current female to monitor and track her cycles with more accuracy. Suggest strategic training for urine collection to assist with this.

## **PROBELM BREAKDOWN**

The scenario is pretty simple since the desire is to collect semen and not specifically breed a female. The scenario will consist of training for collection by keeper staff using primary training to determine how much the chimpanzee remembers of training and then shaping and redirecting his behavior to the AV.

## **APPROACHES**

The paradigm would consist of the following:

1. Facility alterations to adapt to collection
2. Pairing a primary reinforcer with a conditioned reinforcer
3. Establishing the conditioner reinforcer
4. Establishing a discriminative stimulus for the behavior
5. Capturing the current behavior
6. Shaping the captured behavior and approximating to what is wanted
7. Desensitizing to the AV and surrounding activity
8. Establishing criteria around the finished behavior

## **ACTION OPTIONS**

For training I suggest starting to pair the primary reinforcer (food) with a verbal or audio bridge. Once trained, progress can be made and other behaviors can be taught if desired. Subduing level of dominance display is one idea. NOTE: There are behaviors that the chimpanzee may remember which might be offered and staff will need to decide whether or not to accept them and if they want to do more training separate from the project.

Construction of an AV will need to be done and adaptations to the fine mesh in the den area will also be necessary. Please note that access to keepers should be limited due to the past history of the animal (including severe attacks on zoo personnel). AV construction directions are detailed in Gould (9190) and Fussell



et al. (1973). Warm water and an airspace are necessary in addition to other strategies for proper collection and success (J. Johnson-Ward, personal communication).

The behavior can be captured initially by the introduction of a new human female to the keeper area. A new discrimination stimulus can be paired with the behavior so it can be illicit when desired. Once predictable, it can be approximated into the preferred performance. Sessions should be delineated clearly to get the desired behavior as quickly as possible since this behavior is also self-reinforcing.

## OTHER

Training progress should go quickly depending on the staff experience and skill. Anticipate swift results based on the animal's background and experience.

## RESOURCES

Fussell, Franklin & Frantz: Collection of Chimpanzee Semen with an Artificial Vagina. *Lab. Anim, Sci.* 23:252-255 (1973)

Gould, K: Techniques and Significance of Gamete Collection and Storage in the Great Apes. *J. Med. Primatol.* 19:537-551 (1990).

*Special thanks to Ms. Johnson-Ward and Dr. Gould and the helpful staff at Yerkes Regional Primate Center.*

Next Month: Elephants

*(About the Author: Since 1978 Diana has been active both in the U. S. and England working with zoos, private collections, an oceanarium, a marine aquarium, and other animal-related organizations involving captive wildlife. She has a broad base of animal experience involving movie & television training, zookeeping, show performances with live animals, education, behavior management, modification and enrichment, rescue and rehabilitation as well as captive breeding and management of endangered species. She currently works as an Animal Behavior Consultant and Trainer for Ark Animals of California working with both exotic and domestic animals. She has authored numerous articles on animal behavior and training. If you have questions for Diana, you may contact her at 1-800-818-7387 or visit her Home Page at <http://www.ni.net/brookhouse.com>)*





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# Legislative Update

*Compiled by Georgann Johnston  
Legislative Advisor  
Sacramento, CA*



---

## 1997 Federal Budget Proposes Cuts In Environmental Funding

Congress has begun the arduous process of developing the FY 1997 budget and associated appropriations packages. Because this is an election year, many representatives hope to see a quick resolution to budget disputes in time for the 1 October 1996 recess when they will return to their districts and presumably be called upon to answer by their constituents.

Both the House and the Senate have already passed Budget Resolutions. Budget Resolutions set the guidelines for broad spending categories and are the first step in the annual appropriations process. Since these two versions differ, they will both go to a conference committee which will try to iron out the differences between them. Unfortunately, both Resolutions call for spending reductions for environmental and natural resource programs and assume significantly increased revenues from drilling in the Arctic National Wildlife Refuge. (See story below.)

After the House passed its form of the Budget Resolution it turned to setting preliminary spending levels for each of its subcommittees. There are 13 subcommittees in all including the Interior Appropriations Subcommittee which funds the Department of Interior, Fish and Wildlife Service, National Biological Service, Bureau of Land Management, and National Park Service. All departments are facing significant proposed funding cuts in the total range of 16 percent.

An alternative method for influencing the environment and spending in particular, both positive and negative, is through "riders" on appropriations bills. This is the means by which listings on the Endangered Species Act was brought to a screeching halt over a year ago. Legislation for funding for certain defense costs carried a "rider" shutting down the ESA. From a citizen's standpoint, the use of riders to influence environmental spending is the equivalent of an end run in football. Citizens tend to follow bills of interest to them and are oftentimes not aware when a bill on a completely unrelated subject has an impact on that citizen's interest target because of the use of riders.

Some preliminary reports from Congress-watchers say that one potential rider will attempt to overturn a recent court decision enforcing the Migratory Bird Treaty Act and halting logging on seven timber "lots" in Georgia. Conversely, other experts believe that representatives up for reelection will try to avoid any controversial riders this year in an attempt to head off problems at the polls.

*Source: Sierra Club Action Alert #214, "Confused by Budget Process", 29 May 1996*

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## Arctic Refuge In Danger From Oil Drilling Plan

1997 Budget Resolutions from both the House and the Senate contain provisions assuming that the Arctic Refuge (the Alaskan National Wildlife Refuge) will be reopened for oil drilling. The Refuge covers hundreds of thousands of acres in Alaska which is home to caribou, waterfowl, fish, and other mammals, many of which are threatened or endangered species.

The plan is to lease approximately 1.5 million acres along the coastal plain. In order to develop the area for oil exploration and drilling, 280 miles of roads, hundreds of miles of pipelines, 11 production facilities, and 2 ports for ship transport would have to be built. Proponents of the plan claim that wildlife has thrived since oil production in other areas of Alaska began. Opponents say that while Porcupine caribou populations have increased slightly, this is due to a decrease in a number of other animals who were previously predators in the caribou's calving grounds.

Furthermore, opponents of the plan point to the fact that grizzly bears, arctic foxes, and gulls residing in the area of the current oil fields have had to become scavengers to sustain themselves where they previously had smaller prey to eat.

Ninety-five percent of the land in Alaska with high or favorable oil and gas potential are already open to the oil industry. The coastal plain is deemed to be "the biological heart" of the Arctic Refuge and many feel it should be protected as wilderness. In exchange for selling oil and gas rights, the U.S. government would receive anywhere from \$850 million to \$1.3 billion depending on who is projecting the figures.

*Source: Sierra Club Action Alert #208, "Facts About Arctic Drilling", 17 May 1996*

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## Surf The Net To Find Out Who Is Lining Your Representative's Pockets

PAC's (Political Action Committees) are currently the major source of funding for the campaigns of U.S. Senators and Congresspersons (not to say state legislative representatives). Now, you can find out which PAC's are contributing to your Senator or Congressperson.

Called "Where You Live", a World Wide Web site developed by the Environmental Working Group, a non-profit environmental research organization in Washington, D.C., allows you to access online data about the environment, economy, and politics in your state, county or home town. PAC contributions for members of Congress are listed back as far as 1990. To access this information, go to <http://www/ewg/> or <http://www.ewg.org> then click on "Where You Live".

*Source: Sierra Club Action Alert #215, 30 May 1996*

*(Note: OK, you guys, you have absolutely no excuse now for not communicating your ideas, news flashes, and gripes to me directly because I have a nation-wide 800 number. It is 1-800-338-7438 and you can call me anytime between 7 a.m. and 10 p.m. Pacific Time. If you want more information about something you read here, if you know about some legislation in your state which affects wildlife, or if you just want to moan and groan about the state of the world and its governments, you can call me.)*

*--Georgann Johnston, Legislative Advisor*



# Can You Zoo Doo?

*by Tom Gannon,  
Woodland Park Zoological Garden  
Seattle, WA*

It was back in 1984 when landfill prices in Seattle skyrocketed to the then unprecedented high of around \$35.00 a ton. This prompted Woodland Park Zoo to search for options to reduce the amounts of solid waste being transported to the transfer station and save some money. Armed with this mission to reduce landfill bills, a grant from Seattle's Solid Waste Utility, and an ethic that embraces the conservation of resources, the **Woodland Park Zoo's Zoo Doo Program** was born.

If there is one thing that all zoos have in common, it is the quite obvious fact that they contain animals. Equally obvious is that these animals eat. One elephant will consume upwards of 100 tons of food every year. Of that 100 tons that goes in, 45 tons go out in the form of some of the best manure available anywhere for composting. Traditionally, zoos in the USA have taken advantage of low landfill fees and brought their manures to a local dump; but the days of cheap landfill fees are gone. This presents both a problem and an opportunity. The problem is more money goes to things that do not directly affect the quality of the zoo; and the opportunity is one of reducing costs, generating income, and creating great publicity by having a made-for-the-media vehicle for demonstrating a zoo's commitment to resource conservation.

The 1994 figures for Zoo Doo in Seattle speak for themselves. Our Zoo Doo program saved the zoo nearly \$60,000 in landfill costs and generated nearly \$19,000 in revenue. The net profit from sales was approximately \$9,000. In addition, Zoo Doo has been featured in the local press, television, and radio, and has gotten national radio exposure. The program has proven to be so successful that other zoos and institutions are using the Woodland Park Zoo program as a model to install their own Zoo Doo programs.

So, **Can You Do Zoo Doo?** Yes, you probably can. Will you be able to realize significant savings in landfill fees? Will you be able to generate significant revenue from sales? What I hope to do with this article is give a general overview of what is necessary to start a Zoo Doo Program and answer some of those questions in the process.

## **Minimum Basic Requirements**

Most horticulturists know the basics of composting. Put a bunch of fresh organic matter in a pile, wet it down, let it rot, and eventually you will have compost. Maybe not the best compost, but compost nonetheless. A successful Zoo Doo operation requires a little more effort; however, the first basic requirement is commitment. We at WPZ have found the program works best if one person

assumes responsibility for the composting operation. This does not mean your zoo has to go out and hire a "Compost Coordinator," but it does help if one person on the grounds crew is willing to take up the reigns and coordinate the effort. This person should also be responsible for contacting the health department concerning the composting operation; but more on that later.

The second basic requirement is space. Space can be a limiting factor for many zoos. In March, I was invited to give a small workshop on composting at the Honolulu Zoo. One of their problems is that land in Honolulu is at a premium, and that includes the land on which the zoo sits. As a result, nearly every square foot on the zoo grounds is being utilized or is slated for some future use. The size of the space needed depends upon the amount of manure available for composting. The Zoo Doo yard at Woodland Park Zoo is 135' x 70' (41.1m x 21.3m) This gives us ample room to have a manure collection area, where the manure is deposited prior to incorporation into a pile (termed windrow), and for seven to eight windrows to be actively composting or curing at a time. In this space, we compost approximately 650 tons of manure, bedding material, etc., yearly. The Honolulu Zoo has been able to utilize space currently designated as a future elephant exhibit, and will hopefully be able to utilize other areas as they become available. In other words, a dedicated space, though desirable, is not necessary; and you can move the composting area as conditions require.

The third basic requirement is water. A standard 3/4" (19mm) garden hose is adequate, though 1 1/2" (38mm) is even better. Adequate water pressure is also highly recommended.

The fourth basic requirement is some sort of machine that can enable you to turn the piles. This can be anything from a tractor with a front end loader, to a skid loader, to a Terrax® bucket loader, to a D-9. The method of composting I recommend is a hot windrow style of composting, and this requires air to get into the piles. In most instances, this means using a front end loader to turn the piles and ensure air saturation. It also gives you a chance to add water if needed.

With these few things, a zoo is pretty much ready to begin composting its manures using a turned windrow style of composting. There are other factors that must be considered first, including what materials to use for composting; ensuring that all materials suitable for composting are composted; and keeping contaminants out of compostable materials.

## **Materials**

We at Woodland Park only compost herbivore manures and bedding materials, leaves, grass clippings, and assorted other non-woody landscape debris. Other types of compostable material are sent to a local commercial composter. This is largely because I do not have the necessary equipment to grind the large amount of landscape debris we generate into a compostable mix. The benefit is that I create a much better compost by not having to use these materials, which can



be difficult to break down in any form without depleting nitrogen levels.

Herbivore manure is used exclusively because of disease factors associated with carnivore and primate manures. Some diseases, such as Toxoplasmosis, are transferable to humans through feces (in this case feline). The high temperatures of windrow composting are enough to kill these diseases, but the risk is still prohibitive. Diseases spread to humans through contact with herbivore manure are extremely rare and are of no real concern when properly composted. There are certain exceptions as to what herbivore manure can be composted, however. If an animal is newly imported, the USDA requires that its manure be disposed of on-site (i.e. incinerated) for a period of six months. After six months, if the animal shows no signs of disease, the manure may be composted. Your zoo vet will have information concerning this regulation. It largely has to do with the concern over the spread of hoof and mouth disease.

It is important to work with the keepers to ensure that they do not contaminate the manures at the unit pickup site with uncompostable materials. Many keepers may be used to throwing out refuse with the manures since it's all going to the landfill. By working with the keepers you can assure yourself of having high quality compostable materials. It will also be necessary to establish manure pickup rounds that ensure compostable and non-compostable manures are not mixed.

## **Windrow Construction**

Once enough material is collected, it is time to create a new pile. This takes about two weeks at WPZ. At one time we attempted to keep different materials separated at the collection phase. This was done in an attempt to get the best possible mix of nitrogenous to carbonaceous materials. The best carbon to nitrogen ratio is about 30:1, 30 being the carbon. High carbon materials include wood shavings, leaves, and straw. High nitrogen materials include manures and grass. Various mixes were tried, but it became apparent that the easiest solution was the best solution. Currently we just mix everything we get thoroughly and have found that the resulting C/N ratio is just fine.

The pile is constructed using the front end loader. In the initial phase the pile can be quite large, larger even than what is normally recommended for turned windrow composting. My first stage piles are no more than 7 feet high and 14 feet wide (2.1m x 4.2m) and may be of any convenient length. As the materials being slowly shaken down into the pile by the bucket loader, water should be sprayed into it. Try to get something like the consistency of a wrung out sponge. Too much water will squeeze out air and reduce composting action. Too little water will result in extremely high temperatures, also reducing the composting action and possibly posing a combustion threat.

## **Pile Maintenance**

Within a day or so of constructing the first pile, the temperatures inside the

windrow should be between 140-150°F (60-65° C) . I record the temperature of each pile weekly. By doing so I can ensure that each pile stays above 140° (60° C) for at least three consecutive days, providing an opportunity for the destruction of weed seeds and pathogens. The temperatures typically stay above 140° for even longer as the heat-loving bacteria continue the composting process. I take the temperatures using a 20" (50cm) probe thermometer that I insert as deeply into the pile as is practical. Four temperatures are taken at the east, west, north, and south points, and an average recorded on the data sheet.

After two weeks of composting, the first pile is ready to be turned. The available oxygen is greatly diminished by this time and even the best made windrows do not breathe enough to get more air into them to continue composting. Forced aeration would allow the pile to sit in the same spot indefinitely, but that is a topic for a future article. As the pile is turned, it is important to judge the moisture level and to continue mixing the material. If the piles are too dry, continue to add water. If the piles are too wet, it may be necessary to incorporate some dry material into the mix. Experimentation is the key to pile maintenance, and before long you will become an expert in what it takes to maintain your piles.

The second two weeks will also see a period of hot composting. The temperatures at the end of the first two weeks will have dipped down somewhat; but with the incorporation of more air through turning they will shoot right up again for at least another two weeks. Around this time the bacterial decomposition action will be giving way to fungal action, and there will continue to be a steady decrease in the temperatures. Each time the pile is turned, it is normal to have a temporary rise in temps as more air becomes available and some materials not fully composted become available to the organisms responsible for decomposition. By the third or fourth turn however, the windrows will continue to dip in temperature. This is the curing phase, as most of the bacterial action is completed and the fungi have begun work on the decaying matter.

The leading cause of compost failure is the use of unfinished compost. Incorporating unfinished compost into a garden will result in a loss of available nitrogen. As a result, it is necessary to ensure that the compost has completely cured. There is no standardized field test to be sure about this; but by giving the windrows at least three months to actively decompose and cure, most compost failure problems can be avoided. Slightly unfinished compost is fine to incorporate into the garden in fall, and according to some gardeners even preferable. In spring however, unfinished compost will do more harm to a garden than good.

## **Marketing Zoo Doo**

I plan on writing a future article detailing various options of marketing Zoo Doo compost. Until then, I've outlined some general ideas that have worked for our zoo as well as others that have Zoo Doo programs.



The market for Zoo Doo falls into two broad categories; bulk sales and novelty sales. We at WPZ sell our compost in bulk twice a year during the **Spring and Fall Zoo Doo Fecal Fests**. The sales are scheduled for March and September to take advantage of the times when most people are working on their gardens and trying to improve the soil. Zoo Doo has proven so popular in Seattle that it is necessary to sell the compost by appointment only. I schedule two people to come in every 15 minutes. This provides a smooth flow of customers going in and out and minimizes waiting time. All compost is loaded by the customer using shovels and pitch forks. We do not use the front end loader due to liability issues concerning injury and vehicle damage. We charge \$16 a cubic yard, which translates into \$40 for a full size pickup, \$30 for a short bed pickup, and \$25 for a small pickup. Odd-shaped trucks or receptacles are eye-balled and an estimate is made based on the \$16 per cubic yard price. I always err in favor of the customer.

Zoo Doo is a hot selling commodity in Seattle and we have never failed to sell out. Demand outstrips supply by about 2:1 and many people get genuinely upset if they can't get their Doo. We have a special phone number set up for people who are interested in buying Zoo Doo which is called the Poopline. By calling (206) 625-POOP, people can get the latest information concerning the most exotic compost in the Pacific Northwest. Before each sale, there is a designated sign-in day when people who are interested leave their day and evening phone numbers. I begin getting calls at midnight of that sign-in day and I'm totally sold out by 2:00 in the afternoon. I keep an alternate list of people who will not be guaranteed any Doo, but will be called if any is left.

While the bulk compost sale is widely popular and is responsible for selling the vast volume of compost generated, it is the novelty sales that the economics of Zoo Doo really come together. Zoo Doo is the only compost in the world that can sell for \$10 for 4 gallons if marketed right. Our big money-maker in the novelty end of the market is the Holiday sale. We make approximately 1,000 two gallon bags and 750 ten gallon buckets, and sell these for \$5 and \$10 each, respectively. They are attractively packaged and are very popular gift ideas for the Holidays. By marketing it this way we are getting at least \$500 a cubic yard for our compost rather than \$16. Zoo Doo is the only type of compost anywhere in the world that can command that kind of price, and I plan on taking full advantage of it. We currently plan on selling small pint and gallon size containers of Zoo Doo in our Zoo gift shop, thus expanding our novelty market. I hope to generate revenues in excess of \$25,000 this year, and continue that kind of growth until all Zoo Doo markets are explored and exploited.

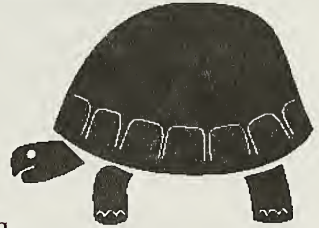
Few opportunities present themselves to zoos the way that Zoo Doo does. I see zoological parks as vehicles for getting out a message of respect for the natural environment and the conservation of resources. This message is lost if zoos continue wasteful practices and only talk the talk of resource conservation. Zoo Doo is a wonderful vehicle for zoos to show that they also walk the walk and can make a little money in the process. My next articles for the AZH Newsletter will go into much more detail concerning composting methodology and marketing of the product.

So until next time, this is **Tom Gannon**, alias **Dr. Doo the Prince of Poo**, signing off from **Compost Command**. Anyone who has any questions concerning starting or improving a Zoo Doo program can feel free to contact me at (206) 684-4828.

*Reprinted with permission from The Association of Zoological Horticulture Newsletter; May/June 1995; Vol. 29, Iss. 3 - May/June 1995.*

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## Turtles with Injured Shells Require Special Treatment



The number one cause for turtles needing human help is falling victim to road injuries. The resulting shell fractures are the most common turtle injury, and can be fatal.

Examine an injured turtle thoroughly. If injuries appear only minor, take a closer look, because sometimes a superficial check is not enough. If there is just a minor crack in the turtle's shell, it may not warrant keeping the creature in rehabilitation. A minor crack will heal by itself. More severe injuries will probably inhibit the turtle from surviving without medical help.

Check for soft tissue damage beneath the shell. If any of the internal organs can be seen with the naked human eye, the turtle's injury needs flushing and suturing. If you are capable of this kind of repair, do so. If not, seek veterinarian help. Inspect the injury site for debris, maggots and any signs of infection. Flies often choose to lay eggs in open wounds. Fly eggs look like very tiny, elongated, white objects. This is before they hatch into larval maggots. Flush the site of injury with lactated Ringer's or any commercially prepared saline solution to cleanse it. **Warning: do not flush reptile wounds with common tap water.** It may remove electrolytes from reptile tissue.

During the initial examination, make sure the abdominal cavity is not open. This is technically called the coelomic area. Bacterial invasion is common when the abdominal cavity is exposed to injury. After cleansing the abdominal area, sprinkle with an antibiotic powder to help fight infection. Diluted Betadine solution works well.

Box turtles suffering cracked shells can be mended with 1/2 or 3/4 inch adhesive tape. Wrap three or more layers around the shell, pulling the obvious crack together. Remember to leave an opening to allow drainage. If the wound is completely sealed, internal bacterial growth can lead to septicemia, which is usually fatal. This procedure does not work well with wood or aquatic turtles as the adhesive tape will not stick with these species.



Another common method of turtle shell repair is with epoxy and fiberglass. Use the five minute type epoxy because it gives you time to line up the shell as it should be naturally, and it requires only a maximum time of five minutes to set. Before using the epoxy, clean all areas of the shell break with acetone to make them very dry. If the break surface appears too smooth, rough it slightly with fine grade sandpaper to make the epoxy hold better.

Purchase fiberglass mesh at an auto-repair shop to use as a substrate for the epoxy. Apply the epoxy first to one side of the cracked shell and then place a mesh patch across it. This creates a bridge patch over the open wound. Then apply a light coat of epoxy over the fiberglass patch. Do not allow any of the epoxy to get into the wound and always allow holes for drainage and saline flushing. After applying the initial epoxy-mesh bandage, allow it to dry for eight to ten minutes. Then apply a second coat and allow to dry.

Turtles are usually very slow healing creatures. The epoxy-fiberglass shell should be used only on adult turtles, not growing ones as it can interfere with their shells. An adult shell can take up to a year to heal after repair.

When using the above procedure with an aquatic turtle, keep it dry for three to five days and then return the turtle to the water. After returning it to the water, make sure the wound site is kept clean daily. Flush it with hydrogen peroxide a couple of times daily.

House recuperating turtles in an enclosure full of leaves and minimize human contact as much as possible.

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Published by The North American Wildlife Health Care Center  
P.O. Box 155 Black Mountain, NC 28711*

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# Husbandry Alert



A 34-year-old Asian elephant cow (*Elephas maximus*) was fed silver maple (*Acer saccharinum*) as a browse enrichment item. A very small amount was actually consumed before it was removed from the holding unit.

A 26-year-old African elephant cow (*Loxodonta africana*) also had access to this maple but refused it.

The next morning there was evidence of profuse bloody diarrhea in the holding stall. Upon examination of both elephants it was found to be coming from the Asian. Salmonella culture taken via rectal exam on both elephants was negative. Complete Blood Cell (CBC) revealed the Asian cow to be slightly anemic and Heinz bodies were also seen. Dark, tarry stools were passed throughout the day by this elephant. The elephant was off her feed for the day, but exhibited no other clinical signs and no treatment was initiated at this time. By the next morning, the stools were normal and follow-up CBC showed no evidence of anemia or Heinz bodies.

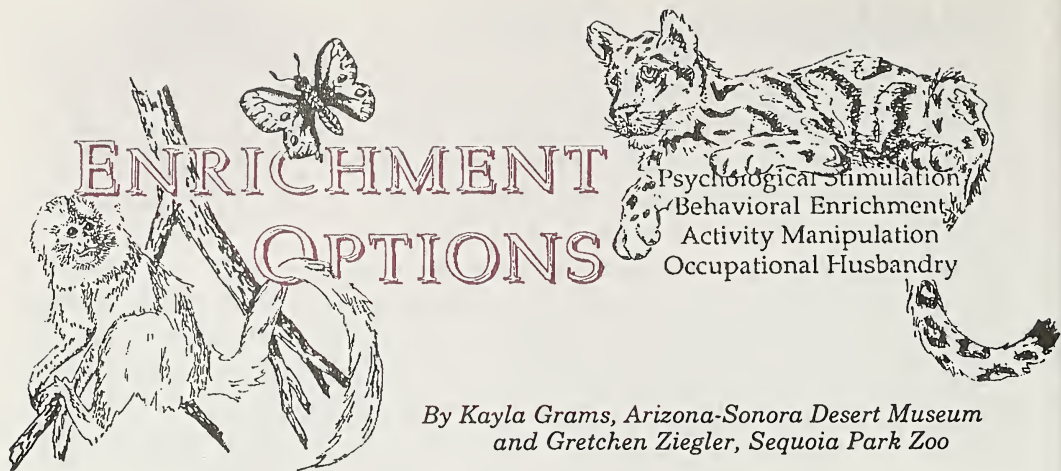
Investigating all husbandry practices had led us to believe that the silver maple may have been responsible for the transient anemia, bloody diarrhea, and tarry stools seen in this elephant. Red maple (*Acer rubrum*) is known to be toxic to horses. The toxin is currently unknown but is believed to be a strong oxidizing agent. This oxidation denatures hemoglobin and results in Heinz bodies. Heinz bodies alter the red blood cells, which are destroyed and result in anemia. It is possible that the maple also had some local effect on the gastrointestinal tract that resulted in the blood diarrhea and tarry stools. Silver maple is found on the approved browse list of many institutions. It is not unreasonable to believe that related species of plants may have the same potentially toxic effects. Although there is no scientific documentation that we are aware of to indicate that any maple species other than red is toxic, common sense and good husbandry practice dictate that serious consideration be given to feeding maple as browse to any zoo mammal.

—submitted by Ray Ball, DVM, Topeka Zoological Park, Topeka, KS  
and the Elephant Management Team

## ***Publication Available***

A second printing of the North American River Otter Husbandry Notebook is available from the John Ball Zoo. This 129-page volume contains sections on Taxonomy, Distribution, Status, Identification and Description, Behavior, Social Organization and Natural History, Reproduction, Captive Management, Hand-Rearing, Diet, Health Care, Behavioral Enrichment, and a general bibliography. The notebook may be purchased for \$10.00 plus \$2.50 s/h from John Ball Zoo, Attn: Otter Husbandry Notebook, 1300 W. Fulton, Grand Rapids, MI 49504; (616) 336-4301.





**GIRAFFE** - We suspend pine trees and/or browse branches from the wire mesh at the "overlook" of their quarters. Giraffe are observed spending a large portion of the day rubbing against the trees, butting the trees and eating the leaves.

We use "eggbutt horse balls" (from Valley Vet Supply) and reinforce the handle with duct tape. Balls are secured to the mesh of "overlook" with chains. Animals rub, butt and lick at these balls during the day. It does seem to reduce signs of boredom when animals are confined to the building.

A piece of PVC pipe is attached to the mesh (on the outside of pen). PVC has numerous holes of various sizes drilled in it at different angles to allow insertion of bamboo and/or browse branches.

We use this bucket to dispense items and reduce boredom while confined indoors. A resealable, plastic bucket (handle removed) has an eye bolt attached to both sides using nuts and washers to ensure a tight fit. The bolts are used to firmly attach bucket to wire mesh. The lid of bucket has a 4-inch diameter hole cut in the top to dispense items without having to remove the bucket. The front portion of the bucket has a rectangular section removed near the base. All edges of this hole are sanded smooth so it is not abrasive. Giraffe use their tongues to search the bucket bottom for a variety of produce treats and/or dietary pellets.

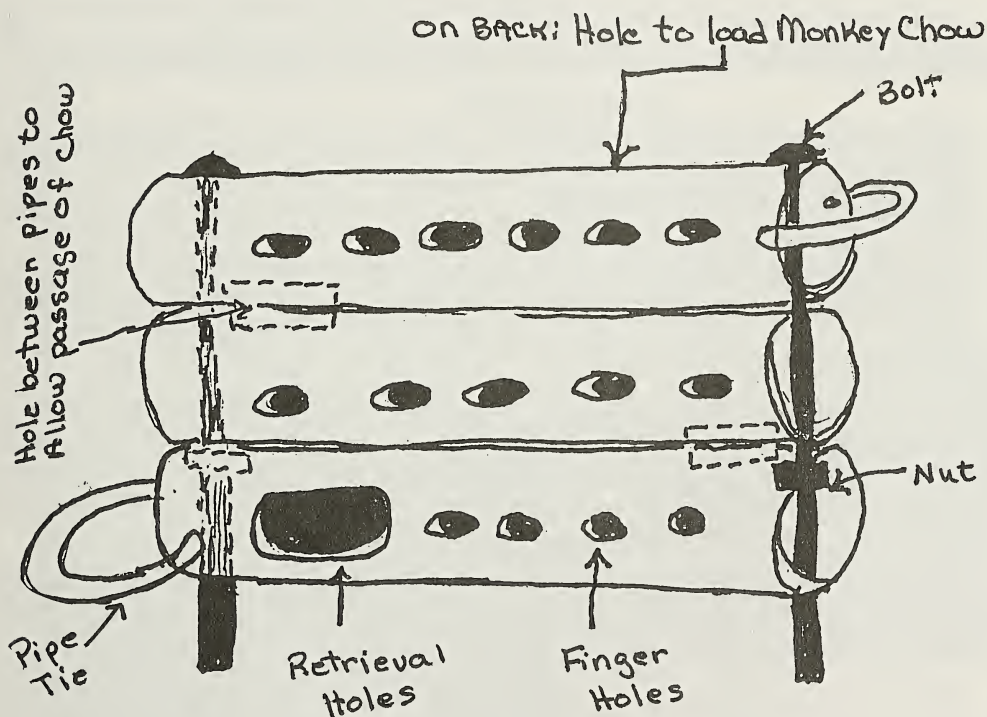
—Wendy L. Shaffstall, African Plains/Rhino Keeper  
Kansas City Zoological Gardens, Kansas City, MO

**PRIMATES** - We give our spider monkeys and chimps warm Tang® or fruit juice in sturdy rabbit water bottles attached to the outside of their wire mesh. If they enjoy the juice, they spend some time licking and sucking the liquid.

—Sequoia Park Zoo Staff  
Sequoia Park Zoo, Eureka, CA

**APES** - An easily made toy we have found to work well with our large primates is something I like to call a PVC Pipe Puzzle. The puzzle can be as large as your facility can handle. PVC pipes (1-inch diameter) are stacked on top of each other and screwed together with a long bolt on either end (see diagram 1 below). Holes large enough for monkey chow to fit through are cut between the stacked pipes on alternating ends (these holes must be drilled before bolting the pipes together). Finger holes on the side facing the primate are drilled along the pipes, too small for the monkey chow to fit through, and this is how the primates receives the food. On the back of the top pipe there is also a hole large enough for the monkey chow, which is used to load the puzzle. The monkey chow is loaded by the keeper in the top hole and then the primate must push the chow through the levels of the puzzle using the finger holes until the chow gets to the opening and the primate can retrieve it. These puzzles can be mounted on the outside of cages for the more manipulative primates or inside for the less destructive ones. The most effective way of mounting I have found is with pipe ties run through holes in the PVC pipe and then around the cage bars. This toy has been used successfully with chimpanzees, orangutans, mandrills, and siamangs. It was given to Diane monkeys with less effectiveness.

—Linda Pastorello, Head Primate Keeper  
The Zoo, Gulf Breeze, FL



*(Ideas appearing in this column have not necessarily been tested by the editors for safety considerations. Always think ahead and use good judgement when trying new ideas. Eds.)*



# High-Tech Gift Helps Answer Nature's Most Nagging Questions

*Excerpted From A San Diego Zoo News Release*

What does a romantic female panda look for in a mate? And just which one of these mountain gorillas is that baby's father?

Check the DNA evidence!

In a transfer of cutting-edge technology most widely known from criminal courtrooms, geneticists at the San Diego Zoo are stepping up the pace of advanced DNA sequencing investigations in support of rhinos and gorillas in Africa, koalas in Australia, and giant pandas in China.

The Zoological Society of San Diego's Center for Reproduction of Endangered Species (CRES) is now the world's first zoo research team with its own Automated DNA Sequencer and DNA Fragment Analyzer package, thanks to a major in-kind donation of the high-biotech equipment by manufacturer Perkin-Elmer, the leading global supplier of analytical and bioresearch systems for research and analysis.

"In the race for survival of precious wildlife, we've been walking at a determined pace. Perkin-Elmer just gave us a new car," said Dr. Oliver Ryder, the Zoo's lead geneticist.

"We can now do this DNA work 10 times faster," Ryder said. "This powerful tool will give us greater insights into the family structure of gorillas, and can help settle nature's most nagging paternity disputes. In a pioneering way, this links the high-tech lab with field biologists' efforts to save the animals in their habitat."

DNA sequencing involves the chemical splitting of tiny strands of genetic material and the search for distinct combinations of chemicals within the DNA strands. These unique chemical sequences become genetic landmarks when scientists compare DNA samples.

Finding a unique sequence repeated in DNA samples from two giant pandas, for example, might indicate one is the father of the other. Conversely, if the genetic marker is absent, panda parentage may be ruled out. DNA sequencing for wildlife can also help identify both the species and gender of animals when this basic information is not obvious by appearance.

Biologists collect DNA samples from wild animals by gathering naturally shed hair or feathers, fecal droppings and other animal residue. A CRES study recently checked hair samples left in the sleeping nests by a group of wild mountain gorillas in Rwanda. The DNA evidence showed the big, strong, dominant male gorilla in the troop was NOT the father of all the babies, as had been usually assumed. Some of the smaller, subordinate gorilla males are finding the ways and means to succeed at breeding.

DNA data help answer critical questions of wildlife migration patterns over

time, identify deadly viruses, and guide decisions in designing effective wildlife preserves, among other applications.

CRES opened the zoo world's first molecular genetics lab in 1975. Today it provides training, material and technical support to wildlife genetics field stations in Kenya, Mongolia, China and Brazil, while continuing to lead numerous other zoo- and habitat- based studies.

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## AZA Regional Conference Schedule

AZA Eastern Regional Conference, March 19-22, 1997 - Memphis, TN. For further information, contact Carol Cratin, Memphis Zoo, 2000 Galloway Ave., Memphis, TN 38112 (901) 725-3450.

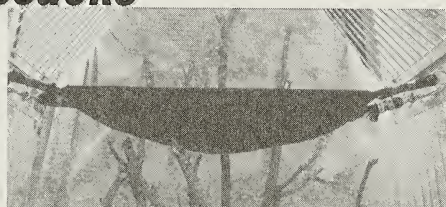
AZA Western Regional Conference, April 9-12, 1997 - Phoenix, AZ. For further information, contact Bruce Bohmke, The Phoenix Zoo, 455 North Calvin Parkway, Phoenix, AZ 85008 (602) 273-1341.

AZA Central Regional conference, May 15-18, 1997 - Cleveland, OH. For further information contact Jim English, Cleveland Metroparks Zoo, 3900 Brookside Park Dr., Cleveland, OH 44109 (219) 661-6500.

### Napsacks

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medium(capuchins and etc)\$35.95+s/h \$5.00.  
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## Workshop on AZA Conservation Programs Scheduled for Detroit Conference

At the 1996 AAZK National Conference in Detroit there will be a workshop on the AZA Conservation Program and how to get involved. The Workshop is being organized by Robert Wiese, AZA Assistant Director of Conservation and Science. In order to make this workshop as useful as possible, we are making two requests. (1) We are looking for keepers who participate in various aspects of the AZA Conservation Program (e.g., studbook keepers, Advisory Group members, etc.). We need you to share your experiences and answer the variety of questions which arise during the Workshop. (2) We would like those interested in becoming involved to submit questions that you would like answered. This will allow us to tailor the Workshop to your interests and needs. If you can help or wish to submit questions, please contact Robert Wiese at AZA Executive Office, 7970-D Old Georgetown Rd., Bethesda, MD 20814 or (301) 907-7777 or [bobwiese@aol.com](mailto:bobwiese@aol.com).



AMERICAN ZOO AND AQUARIUM ASSOCIATION

## Materials Sought by Enrichment Committee for Conference Enrichment Handout

This is a reminder to send your enrichment ideas and items to be published and distributed at the National Conference in Detroit. All information should be typed or printed on standard (8 1/2 X 11). Be sure to include the following: Your name, institution, address and phone #, animal(s) enrichment used for, materials needed, item dimensions, and sketch of item.

Mail or fax as many item designs as you would like to: Dianna Frisch, Columbus Zoo, 9990 Riverside Dr., P. O. Box 400, Powell, OH 43065; Fax - (614) 645-3465; Phone - (614) 785-9951.



**1996 AAZK NATIONAL CONFERENCE  
DETROIT, MICHIGAN  
OCTOBER 6-10, 1996**

Conference '96 is approaching quickly. Don't miss these important deadlines:

- \* 1 September 1996 - Conference Registration Late Free charged after this date.
- \* 1 September 1996 - Pre- and Post-Conference trips reservations and deposits are due.
- \* 1 September 1996 - Exhibitors registration forms and fees are due.
- \* 20 September 1996 - Conference rates for hotel rooms are guaranteed up to this date.

This year we'll be testing new waters. We're going to use that part of the anatomy which Keepers must use most in order to survive...our brains. We're going to play relay with our synapses and stretch our minds to the limit. So leave the wheelbarrow in the barn. And leave the physical events to the Olympians in Atlanta. Join us in the 1996 **Zoo Olympics of the Mind!** It's more than just trivia. It's more than just a game. It's what we know that counts.

Would you like to help raise money for National AAZK, Inc. and the '96 Conference? It's easy! Just bring or send auction items to the conference as donations to the Silent and Live Auctions. 33% of all monies raised by the auctions is allocated to AAZK, Inc. for general operations. For further information, contact Kevin Koch at 1-810-398-0903 ext. 3183.

For those people flying into Detroit Metropolitan Airport, shuttle service is available for transportation to and from the Crowne Plaza Pontchartrain Hotel and Cobo Conference/Exhibition Center. The rates are \$13.00 one-way or \$24.00 round trip. For further information, dial 1-800-488-7433.

If you are driving to the conference, please leave plenty of extra time on your agenda to visit some of the numerous animal facilities in the Great Lakes region. Many zoos are within driving distance of Detroit. AAZK Chapters in this region invite you to stop in for a tour. If you are interested in driving to the Toronto Metro Zoo or Windsor Casino, it is advisable for Americans to have your birth certificate or passport accessible.

Calling all videos... Don't forget to bring educational, entertaining, zoo or animal related videos to share in an informal setting. There will be a VCR available in the Hospitality Suite for video viewing.

Continental Airlines will be handling conference travel arrangements. For further information, please contact Susan or Barabara at the AAZK administrative Offices:  
1-800-242-4519 (U.S.) or 1-800-468-1966 (Canada)

Anyone interested in doing a Poster Presentation, please contact Linda Wachsberg to reserve space, etc. 1-810-398-0903 ext. 3185 It's not too late!



1996 AAZK National Conference  
Detroit, Michigan  
October 6-10, 1996

**CONFERENCE REGISTRATION FORM**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State/Province: \_\_\_\_\_

Zip: \_\_\_\_\_ Phone/Fax: (    ) \_\_\_\_\_

Zoo Affiliation: \_\_\_\_\_ Title: \_\_\_\_\_

Primary fields of interest: \_\_\_\_\_

AAZK Chapter: \_\_\_\_\_ AAZK Membership Status: \_\_\_\_\_

Number of AAZK Conferences you have attended: \_\_\_\_\_

Presenting a Paper, Poster or Workshop?    ☐    Yes    ☐    No

Title: \_\_\_\_\_

AAZK Committee member?	Yes _____	No _____
Bringing an Auction Item?	Yes _____	No _____
Interested in a T-shirt?	Large _____	X-Large _____
Vegetarian?	Yes _____	No _____ Type: _____

Arrival Date and Time: \_\_\_\_\_

**CONFERENCE FEES**

Full Conference Rates:

AAZK Member or Spouse	\$110.00	___
Non-Member	\$120.00	___
Late Fee*	\$ 10.00	___

Daily Conference Rates:

Icebreaker	\$10.00	___	Wednesday	\$30.00	___
Monday	\$25.00	___	Thursday	\$20.00	___
Tuesday	\$30.00	___	Banquet	\$20.00	___
Late Fee*				\$ 3.00	___

\*Late Fee charged after 9-1-96    Total Amount Due: \$ \_\_\_\_\_

Fee does not include cost of Conference Proceedings. Fee includes \$20.00 contribution to AAZK National. Make checks payable (U. S. Funds) to: Detroit Chapter of AAZK. Return form and all fees to: Pat Granberry & Beth Johnson, Detroit Chapter of AAZK, 8450 West 10 Mile Road, Royal Oak, MI 48068-0039.

1996 AAZK National Conference

Detroit, Michigan

October 6-10, 1996

**HOTEL REGISTRATION FORM**

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**CONFERENCE ROOM RATES (Add 14% Room Tax)**

\_\_\_\_\_ **\$70.00 Single**    1-2 People per Room (1 Double Bed)

\_\_\_\_\_ **\$80.00 Double**    3-4 People per Room (2 Double Beds)

\*\*\*AAZK Conference Room Rates are guaranteed until **September 20, 1996**. Reservations made after this date will be on a space available basis only.

Arrival Date and Time: \_\_\_\_\_

Departure Date and Time: \_\_\_\_\_

Hotel Check-in: 3:00 PM - Check-out: 12:00 noon

Hotel Parking Fee: \$3.50 per day

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DETROIT, MI 48226-4416**



## A Sample of Speakers, Workshops and Papers of the 1996 AAZK National Conference

- \*Orangutan Conservation. Birute M. F. Galdikas (Orangutan Foundation International)
- \*Strategies & Actions for Field Conservation: Coalition for Reefs & Rainforests. \* An Ecosystem Survival Workshop. Norman Gershenz (Center for Ecosystem Survival).
- \*Biodiversity in Zoos: or Not All Animals Have Hair. \* International Bear Parts Trade Linda Wachsberg (Detroit Zoo).
- \*Social Relationships in Wild Baboons. Dr. Barbara Smuts (University of Michigan).
- \*Hippopotamus Underwater Behavior and Communication. \*Hippopotamus Training: Implications for Veterinary Care. Stephen Krueger (Toledo Zoo).
- \*Contraception. Dr. Cheri Asa + Ingrid Porton (St. Louis Zoological Park).
- \*Creation of an Age-Diversified Gorilla Group Through Alternative Means. Susan White (Columbus Zoo).
- \*The Fund Raising Success Story of Bowling For Rhinos. Patty Pearthree (AAZK).
- \*The Elephant "Hump"; A special method to hold and use water. \*Elephants Never Forget. Dr. Jeheskel (Hezy) Shoshani. (Elephant Research Foundation).
- \*Safety First, and Always...At the Jackson Zoo. Tom B. Brown (Jackson Zoo).
- \*Mustached Tamarins on the Loose. Linda Pastorello (Gulf Breeze)
- \*Nectar-feeding as an Enrichment Technique with Island Flying Foxes. Dana LeBlanc (Lubee Foundation, Inc.).
- \*Hands-on Hoof Trimming. Dr. Ross Brown & Dr. Dalen Agnew (Detroit Zoo)
- \*Record Keeping with Word Processors, Spreadsheets and Databases. David Merner (San Diego Wild Animal Park)
- \* Management/Employee Relations. Toni Vecchio (Roger Williams Park Zoo)
- \*Red Uakari Research in Peru. Suzi Leonard (Detroit/Dallas Zoos WRE Program)
- \*Friends of Rare Amphibians of the Western Gnats (FRAWG) Fred Swengel (Minnesota Zoo).
- \*Water Conservation: What Keepers Can Do. Jennifer Brown & Pat Fabian-Chavez (Rio Grande Zoo).
- \*Zoo Ethics. Dr. Ron Kagan (Detroit Zoological Institute).
- \*From Rags to "EN" Riches. Lucy Sergenson (North Carolina Zoo).
- \*Detection and Treatment of a Possible New Disease Syndrome in a Captive Black Rhinoceros. Christine M. Bobko (Denver Zoo).
- \*The Water Bucket or Speaking of Tools, Don't Look at Me, I Didn't Take It. Leslie Keys (Detroit Zoo).
- \*Bat Conservation. Bob Benson (Bat Conservation International).
- Giraffe Squeeze Techniques. Beth Johnson (Detroit Zoo).
- \*A Successful Reintroduction of an Initially Rejected *Pan troglodytes* Newborn to it's Natural Mother. LeeAnn Anderson (Honolulu Zoo).
- \*Buffalo Zoo Predator Exhibit. David E. Bringham (Buffalo Zoo).
- \*The Care and Procedures Involved in Mending a Broken Leg of a Two and a Half Year Old Giraffe - A Keeper's Perspective. William Pentler (Rio Grande Zoo).
- \*The Pet Primate Trade. Scott Carter (Detroit Zoo).
- \*"Inhlovudawana" or "Little Elephant": Managing Warthogs Through Operant Conditioning. J. Phillips, V. Cloninger & G. Laule (North Carolina Zoo).
- \*Enrichment Diana Frisch (Columbus Zoo and AAZK Enrichment Committee).
- \*Carnivore Enrichment. Dr. Ann Duncan (Detroit Zoo and Veterinary Advisor to AAZK Enrichment Committee).
- \*Rhino Conservation. Andy Lodge & Anna Mertz. (Ngare Sergoi Rhino Sanctuary)
- \*Asian Elephant Nail Patch. David Nestale (Detroit Zoo).
- \*Conservation and Reintroduction of the Costa Rica Scarlet Macaw and the Great Green Macaw. G. Suzanne Chacon (Aves de las Aves)
- \*\*AZA Conservation Program and Keeper Involvement. Dr. Bob Weise (AZA Conservation Academy) A special Professional Education workshop brought in by AAZK, Inc.

This is just a sample of the presentations expected to be at the '96 Conference in Detroit. There will be many more.... Don't miss out!

# *Development of a Zoo Keeper/ University Student Research Project*

by

*Judie Steenberg, Zoo Keeper, Woodland Park Zoological Gardens (WPZG),  
and*

*Lisa Dabek, Ph.D. University of Washington (UW), Tree Kangaroo SSP<sup>©</sup>  
Research Coordinator*

The following information is based on a Tree Kangaroo Research Project funded by an AAZK Research Grant. The experiences involved in developing and carrying out this project can be applied to other keeper research projects. The primary purpose of this paper is to share this information and encourage keepers to collaborate with university students to conduct research projects. Neither of the authors could have accomplished this project without the cooperation of the other party.

In May, 1990, the authors each presented a paper at a Tree Kangaroo Symposium in Washington, D.C. (Dabek and Hutchins 1990, Steenberg & Smith 1990). During a long bus ride to visit the National Zoological Park's Conservation and Research Center (CRC) at Front Royal, VA, to see the tree kangaroo collection, we talked about the various problems in the captive management of tree kangaroos, especially the questions regarding reproduction. Little did we realize that this brainstorming would result in a major research project, or that a zoo keeper and university student would collaborate to become major participants in the Tree Kangaroo SSP<sup>©</sup>.

The gestation period for the Matschie's tree kangaroo (*Dendrolagus matschiei*) is an average of 44 days; this has been well documented by the CRC Staff (Collins, 1986, Heath et al, 1990, Mullett et al, 1988 and Wemmer, 1985). However, the estrous cycle of female tree kangaroos remained vague; a range of 51-79 days was reported in the literature (Heath et al. 1990). It is also generally accepted that female Matschie's tree kangaroos do not exhibit physical signs of cycling, and are receptive to males for a very short period of time. The female tree kangaroo's period of receptivity can be as short as 24 hours based on personal experience (Steenberg), communication with Larry Collins, CRC Mammalogist and records at the CRC and Woodland Park Zoological Garden (WPZG). Therefore, if estrus is missed, it would be approximately two months before another estrous period occurred. To properly manage the reproduction of tree kangaroos it is important to have a well established estrous cycle for each female.

The estrous behavior of female Matschie's tree kangaroos is subtle and can easily be missed by the untrained or uninformed Keeper. To help solve the problems associated with the variation in estrous cycles (51-79 days), the lack of physical signs of estrus and the short period of receptivity, a research project was developed. Initially, Scott Barton, WPZG Senior Keeper, suggested that fecal steroid assays might be used to help determine the estrous cycle in



Matschie's tree kangaroos. Subsequently, Judie Steenberg, WPZG Keeper and Lisa Dabek, who was at that time a University of Washington (UW) Doctoral Candidate, developed a research project to better define the female Matschie's tree kangaroo's estrous cycle through use of a fecal steroid assay (FSA) technique. The results of the FSA's would be correlated with simultaneous behavioral studies.

The questions we wanted to answer were:

- Are there behavioral cues indicating a female is in estrus?
- Can fecal steroid analysis be used to correlate levels of estrogen and progesterone with estrous behavior?

Encouraged by colleagues involved with the captive management of tree kangaroos, we applied for several grants (this was an experience in itself). Although we "came close", we did not receive the funding needed for a joint six-month project. This was our first experience applying for a grant, and in the final scoring we were 0.4 points shy of the cut-off score to receive funds. There were moments like this, when the thought of giving up on the whole project seriously crossed our minds.

Overall, the reviews of our grant application were quite encouraging, which was an important incentive to continue our efforts. However, some of the reviewers felt our project was too ambitious, primarily because FSA had never been tried on a marsupial species. If you are going to get involved in a project such as this, be prepared to be persistent, patient and flexible when necessary.

At this point it seemed that the next logical step would be to conduct a pilot study to clear up the question of using FSA on a marsupial species and test the feasibility of our proposed project. It was decided that Steenberg would go to CRC for a one-month period to determine if the FSA process worked on tree kangaroos and do observations to begin documenting estrous behavior. Again, funding was a factor; WPZG provided an airline ticket, matching paid leave, a video camera and tape for the pilot study. The CRC provided housing, office space and use of the laboratory on a gratis basis. The Staff at CRC's Small Animal Facility (SAF) provided steadfast support throughout the project. The 18 tree kangaroos at SAF provided the largest available study population to test the preliminary question of whether or not a tree kangaroo estrous cycle could be charted using the FSA process.

To fully utilize the time spent at the CRC on the pilot study, the following tasks were to be accomplished:

1. To determine the feasibility of keepers collecting "fresh" fecal samples from female tree kangaroos and getting them into a freezer within 30 minutes of defecation.
  - a). Would CRC keepers be able to collect sufficient samples during the course of the daily routine to conduct a reliable study?
  - b). Would assistance by other personnel be necessary?

2. To observe and document tree kangaroo behavior on a scan sampling basis at one-, two- and four-hour intervals, with two 24-hour observations of the entire collection, during the course of the study.
  - a). What basic behavior patterns could be determined for individual animals?
  - b). What were the confounding factors to be considered in a long term study?
  - c). Did any of the females cycle during the study?
3. To review CRC tree kangaroo records, both current and historical, for reproductive and life history data to answer the following questions.
  - a). What type of information could be collected from existing records?
  - b). How could these data be utilized to provide information about estrous behavior and to establish life history traits?
4. To collect feces from tree kangaroos to assay for levels of estrogen and progesterone.
  - a). Could fecal steroid assays be used to determine levels of these hormones in tree kangaroo feces to more closely define the estrous cycle?
  - b). Would modifications need to be made in the process to assay marsupial fecal samples?

By now it was the summer of 1991. During Steenberg's one month stay at CRC, Collins, and the entire SAF keeper staff, gave their full support to the pilot study.

In order to collect feces and have them in the freezer within 30 minutes of defecation, it became necessary to include all CRC keepers, the researcher and anyone else who happened to see a female tree kangaroo defecate. An occasional fresh sample was collected by CRC keepers during the daily routine of caring for the animals. However, it soon became apparent that it would be difficult for keepers to collect sufficient fresh samples for analysis without previously monitoring and documenting normal times of defecation for each female tree kangaroo in the study. This finding was a major factor in the proposed long-term project and required further review and planning. Task one accomplished.

A primary objective of the pilot study was to determine if FSA would work on tree kangaroo feces. Feces collected at the CRC from a female, just before and after copulation, gave good evidence that the FSA process did work on tree kangaroo fecal matter. There was definite variation in her estradiol levels, consistent with estrus. These variations correlated with a one-day change in behavior of this female, just prior to copulation. Also of interest is that the concentration of estrogen in tree kangaroo feces was significantly higher than





in that of yellow baboons (*Papio strepipus*); this required a different dilution for the assay of tree kangaroo feces. At this point....tasks two and four had proved feasible.

Dr. Sam Wasser, noted for his work in developing the fecal steroid assay process for use in reproductive studies, and Research Laboratory Technician, Niki Presley, generously provided training in the process and carefully supervised this first testing of FSA on tree kangaroo feces.

A review of the CRC tree kangaroo specimen records contained valuable information on reproduction that would be useful in compiling data for Matschie's tree kangaroo life history characteristics. Additional data from over 3000 samples of tree kangaroo behavior collected during the pilot

study has also given us valuable insight regarding tree kangaroo behavior. Task three was also accomplished.

In November 1991, the Tree Kangaroo Research Project gained added importance when the Tree Kangaroo Species Survival Plan (TK-SSP) was formed and reproductive studies were determined to be of primary importance for the long-term management of Matschie's tree kangaroos. The TK-SSP 1993-94 Master Plan's Research Goals and Objectives included a statement to continue fecal steroid assay studies to resolve questions regarding female reproductive cycles.

The next step was to further test the possibility that keepers could collect daily samples of tree kangaroo feces within the 30-minute time restriction. This work was accomplished at the Woodland Park Zoological Gardens (WPZG) in Seattle, Washington. With the approval of WPZG Senior Staff, Australasian keepers Tina Mullett and Allison Barr agreed to work with researchers and participated in a six-month long, daily collection of feces from three female Matschie's tree kangaroos. Keepers also used a daily check sheet to document behavior.

To establish whether there was a time frame when tree kangaroos defecate, during the course of a routine day, a week-long tree kangaroo "poop-watch" was conducted by a group of WPZG's, dedicated Docent Research Observers. After seven days of observing WPZG's three females, from 0800-1600 hours, it was determined that each female had a rather specific time frame during which she defecated. WPZG Australasian Unit keepers also found that defecation could

be stimulated by the early morning feeding of a stalk of celery.

The 30-minute time element of getting the fecal samples into a designated freezer was still a limiting factor. USDA regulations require that feces be stored separate from any food items; the closest non-food freezer was on the other side of the Zoo. An article was published in the Woodland Park Zoological Society's Newsletter about the Tree Kangaroo Research Project and a request for a freezer was added to their "Wish List" for donations. The USDA regulation problem was solved by the donation of a new 12 cu. ft. freezer by the Elfund Society, Seattle, WA, specifically for this project. The freezer was set up in the Australasian Unit.

In December 1991, well behind our projected schedule, daily behavioral check sheets were started and daily fecal samples were collected on WPZG's three female Matschie's tree kangaroos. Collecting continued for a six month period to insure that data from a minimum of two full estrous cycles would be collected.

Another confounding factor soon became evident, at WPZG. The sand substrate in the tree kangaroo exhibit stuck to the fresh feces. Since the feces dropped from a distance of anywhere from one to fifteen feet, they often rolled and were completely coated with sand. Not to be daunted, daily collecting continued while we determined the best way to remove the sand from the feces. During fecal steroid assay all debris must be removed, since the weight of the fecal both fresh and after freeze-drying is critical to the analysis. We learned that it was best to partially freeze the feces and then use a soft toothbrush to whisk off the sand. The thank-you letter to Steenberg's dentist, for the donation of two dozen toothbrushes, became quite a topic of conversation in his office.

Once a fecal sample was collected it had to be cleaned, weighed, logged and smashed....smashing facilitated freeze-drying the sample in a lyophilizer. It is important to emphasize the dedication of the keepers who worked the Australasian Unit during this time, especially Unit Keeper Mullett. Collecting and processing three fecals daily, in a timely manner, can get tedious and often required extra time to accomplish.

Meanwhile more grants were written and Dabek submitted a proposal to go to the CRC to conduct a six-month long study on six of CRC's tree kangaroos. Dabek would work on the correlation of their estrous behavior with fecal steroid assay of both estrogen and progesterone. Additionally, fecals and behavioral data from the three WPZG females were sent to CRC for analysis. By now it was the summer of 1992, more than two years after we started planning the project. An important lesson here is that research projects can take a lot longer than you expect. Be realistic and liberal in your time estimates.

As a part of the long-term study, data were collected from CRC's animal records to better define the basic life history characteristics for Matschie's tree kangaroos. Additional information on joey developmental milestones was also collected. Collectively, these studies were to be the basis for Dabek's doctoral dissertation (1995).



During this time we received notification about a large grant that had been re-applied for and learned the Tree Kangaroo Research Project qualified ....but the fund ran out of money!!! It was time for creative financing. The \$750.00 from the AAZK Research Grant, a privately donated airline ticket, UW special funding, the Puget Sound AAZK Chapter's \$400.00 grant and the use of some personal funds comprised the financial support of the Tree Kangaroo Research Project.

To reduce the cost of analyzing the WPZG fecals, a volunteer for the Australasian Unit made arrangements with a UW lab to use their lyophilizer to freeze-dry the fecals. Volunteer Mary Welch personally re-weighed and recorded each of 300+ samples before and after freeze-drying them. This reduced the cost of analysis by approximately 50%. WPZG helped again by covering the cost of shipping the samples to CRC via Federal Express Overnight Delivery. The samples had to remain frozen until they were to be analyzed. They were shipped on dry ice, in a styrofoam cooler, and arrived at the CRC still frozen solid.

Throughout this project both the CRC and the WPZG provided office space, office and lab supplies, the use of various equipment and long distance telephone/FAX service at no cost to the project. While it is difficult to put a dollar value on this type of support, it was very important to the research project.

Perseverance was a key element in achieving the goals and objectives of this project. A few people were serious roadblocks in seeking funds to conduct this project. Even though they were people of position we did not let their biased opinions and lack of support stop us. The important message here is that our project was valid, represented an opportunity to collect critical information for the improved propagation of the species, and was supported by the TK-SSP. Instead of being discouraged, we re-evaluated our goals and objectives, consulted with other people knowledgeable about the subject, and found a way to accomplish the project.

The \$750.00 AAZK Research Grant was a critical element in completing the project. We could collect all of the fecal samples we wanted but without funds to conduct the analysis it didn't mean much. Because of this project the Tree Kangaroo SSP<sup>©</sup> now has a proven method to determine an exact estrous cycle in female Matschie's tree kangaroos.

However, this project is really not finished. The next step is to better define the critical time element for getting feces into the freezer; freezing stops the metabolic processes in the fecal sample. WPZG Keepers collected additional fecal samples for a test study to determine if overnight samples, collected the first thing in the morning, would have satisfactory levels of estrogen and progesterin; preliminary test results were good. The question is: will overnight fecals, when compared with fresh samples, give comparable, reliable data? If overnight fecals prove to be suitable, we have a tool that can be used by all zoos to define any female tree kangaroo's estrous cycle. Of importance is that it could then be done in the course of a Keeper's daily routine, thereby insuring

consistent sampling. A key factor for keeper involvement in any research project is the impact it has on available time; it has to “fit” in with all of our other routine duties.

The results of Dabek’s work, “Behavioral Aspects of Breeding Captive Matschie’s Tree Kangaroos (*Dendrolagus matschiei*): Estrous Cycles of Females and Development of the Young “ have provided data of immediate use, as well as a foundation for subsequent ex-situ reproductive studies. There is also a strong possibility that the FSA process can be applied on an in-situ basis as well.

In 1993-94, Dabek received funding to conduct an in-situ feasibility study of wild tree kangaroos in Papua New Guinea. During that trip both Dabek and Steenberg presented papers at the Australasian Region Association of Zoological Parks/Australasian Society of Zoo Keepers (ARAZPA/ASZK) Conference, in Darwin, Australia (Dabek 1995, Steenberg 1995). Dabek also met with field biologists in Australia and Papua New Guinea and wildlife personnel in Australia who were interested in learning about the use of FSA in tree kangaroo reproductive research.

Steenberg (1994) presented a paper at the AAZK National Conference in Omaha, which reported the mean estrous cycle of 55 days (Dabek 1995) for Matschie’s tree kangaroos. Subsequent articles on various aspects of the original project (FSA methodology, tree kangaroo developmental milestones, and life history traits) are being submitted for publication in Zoo Biology (Steenberg, Collins and Dabek, in prep.) and the Journal of Reproductive Physiology (Dabek, Wasser and Steenberg in prep.). Due recognition will be given to AAZK for the Research Grant which helped fund this important science project.

In closing, we would encourage other keepers interested in doing a research project to consider collaborating with a graduate student from a local University. You will need to thoroughly discuss the project, carefully define each other’s role, and be exceedingly open and honest with each other. Respect one another’s contributions and limitations, and pull together to accomplish the end goal. During the course of this project we did not always agree, but we always resolved differences and got back on track.

Because of this project, there is the promise of continuing to answer other questions about tree kangaroo reproductive biology using a non-invasive technique. There is also further potential for utilizing this technique and knowledge for in-situ conservation projects. You just never quite know where a project might lead.

**Acknowledgments:** The success of a major project such as this is the result of help and cooperation from many people. To the Advisors and Staff from the Conservation and Research Center (CRC) Larry Collins, John Watson-Jones, Angie Heath, Greg Peterson, Bobby Rodden, Melissa Rodden, Mary Willeford Bair, Dr. Sam Wasser, Niki Presley and Laura Flicker; University of Washington (UW) Staff: Drs. Joan Lockard and Margaret Thoughtless and Mary Welch; WPZG



Administrators: David Towne and Judy Ball; with special thanks to WPZG Docent Observer "Poop Watchers", WPZG Keepers Tina Mullett and Allison Barr and to the many Volunteers who helped clean tree kangaroo fecals we extend our sincere appreciation. All of you are to be commended for your commitment to this project. It couldn't have happened without your help.

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# Book Review

## **Serengeti II- Dynamics, Management, and Conservation of an Ecosystem**

Edited by: A.R.E. Sinclair and Peter Arcese, 1995

By the University of Chicago Press

5601 South Ellis Ave. Chicago 60637

665 pgs. Paperback Price: \$34.00

*Review by Jo Ann Haddad  
Sr. Mammal Keeper  
San Diego Wild Animal Park  
Escondido, CA*

Don't let the size and appearance of Serengeti II intimidate you too much. Despite its textbook resemblance I found this book very informative and fascinating reading. Serengeti II is by no means an easy read, but with patient concentration most laypersons can traverse its numerous topics of discussion.

In the first volume written on the Serengeti-Mara area, Serengeti: Dynamics of an Ecosystem, research undertaken in the area through 1977 was covered with the main goal being to understand the ecological principles that promote biological diversity in natural ecosystems. In this second volume, Serengeti II, the results of this research has been compiled in order to "advise managers who plan for, and respond to, the social, political, and environmental perturbations that affect conservation policy." The presented research has been grouped into five main categories to aid in facilitating focal interest. An overview is divided into two chapters covering the Serengeti-Mara's past and present, and the Serengeti in the context of worldwide conservation efforts. The next four areas of concentration are divided into: plants and herbivory, herbivores and predation, predator demography and behavior, and conservation and management. Each area of concentration presents from three to nine research studies focusing on aspects of that particular concentration.

By having the topics outlined so clearly, I was able to easily pick and choose which studies I wanted to read. I read a few studies from each of the areas of concentration and was surprised not by how much I learned, but by how much I enjoyed the learning. As I stated earlier, this is not a book of stories but a collection of research that can be read and for the most part understood by any layperson with the desire to learn about the Serengeti-Mara. The studies presented have a balanced blend of statistical jargon and well defined concepts so that even non-scientists can understand the general research and conclusions of each study.

All the studies in Serengeti II culminate in the final essay in a model to evaluate alternative management policies. A workshop was held in 1991 at the Serengeti Wildlife Research Centre to assist in the transfer of scientific knowledge from the researchers



to the managers of the Serengeti-Mara region. To assist in the coordination of research and policy evaluation, a computer model was generated to simulate and explore six scenarios that reflected a variety of natural and human-induced changes in the Serengeti given the comprised statistical data. The scenarios reflected what the model predicted could happen rather than a best scientific estimate since the four-day workshop was primarily organized to facilitate channels of communication and identify research priorities.

Seeing how individual research studies can work together and with the local people and governments in planning the future course of action for a particular region gave me hope. The process of the workshop was more important than the product by showing how we all come together to work towards the same goal even if we're coming from different directions.

I strongly recommend reading or at least perusing Serengeti II to anyone interested in the current and future plight of the Serengeti-Mara region. Not only will the reader gain a better understanding of the past and present mechanics of the region but become familiar with current research and concerns in the area and some suggestions as to their future direction

### **Lemurs of Madagascar**

By Russell Mittermeier, Ian Tattersall, William Knosant,  
David Meyers, and Roderic Mast. 1994

Conservation International, 1015 18th St. NW, Suite 100

Washington D.C. 20036

Paperback, 356 pgs. Price: \$35.00

*Review by Kelly K. Miles, Zoo Volunteer  
Woodland Park Zoo, Seattle, WA*

Lemurs of Madagascar is the first in a new series of Tropical Field Guides published by Conservation International. This compact guide covers a very wide range of information. From lemur origins, their discovery and field studies, to extinct lemur history, existing lemur behavior, distribution, and conservation.

The guide is well-organized and incredibly easy to use. Chapter six, which is 200 pages long, consists of detailed descriptions of living lemurs. There is a complete listing of the 32 lemur species and 50 lemur taxa currently recognized. Included for each genus is a distribution map. Each species and subspecies is described in detail covering five categories: Identification, Geographic Range, Natural History, Conservation Status, and Where To See It.

The guides illustrations are done by Stephen D. Nash and they alone could justify purchasing this book. With 35 color plates of photographs and lifelike drawings, 135 postural, locomotor and behavioral line drawings and over 28 black and white photos, the reader is able to quickly learn how to identify and appreciate these fascinating animals.

This guide could be of great value not only to those planning to visit Madagascar, but keepers who work with prosimians, education/conservation staff and any zoo library.

## Wolf Reintroduction Project Update

Reintroduction of the gray wolf in Yellowstone National Park in Wyoming and in central Idaho has been so successful that no new releases will be made in either area in 1997, Interior Secretary Bruce Babbitt announced last month.

"The wolves already released have reproduced well and suffered few losses and the program so far is not only under budget but ahead of schedule," Babbitt said. Ralph Morgenweck, the Service's regional director in Denver, CO, said, "If the wolf population in one recovery area does appear to lag, we have the option of moving animals from one area to another."

"Forgoing releases in 1997 will also help reduce potential wolf pack conflicts," said Ed Bangs, the wolf reintroduction program coordinator. Seven wolves have been lost in Yellowstone in 1996 -- two adults and one pup were believed killed by other wolves, two were illegally killed, one was hit by a car, and one died after falling into a hot spring.

Seven litters of wolves were believed born this spring to reintroduced parents in central Idaho. Four of the reintroduced Idaho wolves died in Idaho in 1996 according to the Nez Perce Tribe, which monitors wolf activity in Idaho. One was shot, one was killed by a mountain lion, one drowned, and one death was from undetermined causes.

*(continued on next page)*



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Fifteen wolves were reintroduced into central Idaho and 14 in Yellowstone National Park in 1995. Twenty wolves were reintroduced in central Idaho and 17 in Yellowstone National Park in 1996.

Bangs said while wolf mortality in Yellowstone was slightly higher than in Idaho, the rate remains below predictions. "With the two litters born last year to the Yellowstone wolves, we started off much better than expected." Bangs said any reintroduction proposals beyond 1997 will be evaluated on a yearly basis.

Prior to the reintroduction of the gray wolf, the animals had been absent from Yellowstone and central Idaho since the late 1920s. The reintroduction goal calls for establishment of 10 breeding pairs in each of three recovery areas for three successive years, which would result in a recovered wolf population and removal of wolves in the northern Rocky Mountains from the endangered species list by 2002. Central Idaho and Yellowstone National Park are two of the recovery areas; northwest Montana is the third, although it is not a reintroduction zone.

--U.S. Fish and Wildlife Service, Department of the Interior News Release 7/15/96

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The Utica Zoo, Utica, NY, welcomes the first-time birth of eight European wild boar (*Sus scrofa*). The six males and two females were born on 24 May 1996. They are the offspring of a 16-month old, first-time mother that is one of only a handful of genetically pure wild boars in the U.S. all eight offspring are being mother-raised and are on exhibit with their mother. (Photo courtesy of Utica Zoo)



# ***Report on the Management of Live Arthropod Exhibits Workshop***

*By Eric R. Eaton, AAZK Associate Member  
Cincinnati, OH*

With insect exhibits and butterfly houses becoming increasingly popular fixtures at zoos, aquaria, and other public attractions, it is important that opportunities for keeper training in invertebrate cultures be made more widely available. To that end, a one-day workshop on the subject was held on 19 May 1996, at the Butterfly Pavilion and Insect Center in Westminster, CO. The event, sponsored and organized by the Terrestrial Invertebrate Taxon Advisory Group (TITAG), was a suffix to the Western Regional Conference of the American Zoo and Aquarium Association (AZA) in Denver.

The 332 attendees were briefed in a variety of areas related to the management of live arthropod exhibits. Federal officials from the U. S. Fish & Wildlife Service (USFWS) and the U.S. Department of Agriculture (USDA) helped immensely in clarifying the often-confusing permit requirements for importing exotic insect species; and simplifying the procedures required for passing facility inspections related to quarantine and containment.

The second half of the workshop was devoted to animal care, including the task of selecting which species to exhibit by deciding what concepts you wish to convey to the public in the arthropod exhibit. Choosing species then becomes a matter of finding ones that best demonstrate ideas like camouflage, metamorphosis, sociality, etc. The care of cultures in captivity, and techniques for housing and propagating species were also discussed briefly.

Since arthropods represent well over 80% of the animal kingdom, and are generally low-cost and low-maintenance, exhibiting these creatures should become a priority in furthering zoo educational missions while cutting costs and maintaining, or even increasing, exhibit diversity. It is up to keepers with an interest in the six- and eight-legged to raise the profile of these animals in the minds of administrators and planners.

To learn more, you may contact: Rachel A. Williams, TITAG Treasurer, c/o Rocky Mountain Butterfly Consortium, P.O. Box 3777, Westminster, CO 80030-0377; Tel. (303) 469-5441, or contact the author at 2812 Price Ave. #3, Cincinnati, OH 45204-1485; Tel. (513) 921-1593.





# ***The Plight of the Quistococha Zoo***

## ***An Update***

*By Antony Taggart, C. E. O. of Zoo Peru Inc.  
and volunteer keeper at the  
Quistococha Zoological Park in Iquitos, Peru.*

Those of you who are regular readers of AKF, may recall an article that I wrote in the April of 1994 edition entitled "The Power of One". Within this article I told you about my early experiences working in a voluntary capacity for the Quistococha Zoo in Iquitos, Peru after leaving my homeland of Australia back in 1993. So as to give you a general recap on the situation, the Quistococha Zoo would have to be set on one of the most majestic settings of any zoo anywhere in the world. Found some 16 miles from the main square in Iquitos, the Quistococha Zoo is situated on nearly 900 acres (360 hectares) of secondary rainforest with a 125-acre (50 hectare) spring-fed natural lake found close to the front of these grounds. Another unique quality about this zoo is the fact that it only houses indigenous species of animals local to the Peruvian Amazon and that nearly all the animals have been either donated by members of the public, or confiscated from poachers.



**This scenic shot shows one of the many raised walkways at the Quistococha Zoo which wind through and into the Amazon rainforest. (Photo by Antony Taggart)**



I began working in a voluntary capacity for the Quistococha Zoo when I realized that the zoo had no qualified staff trained in animal husbandry, and that many of the animals were poorly housed in small overcrowded cages which generally were in a bad state of repair. Realizing that this problem was a lot bigger than I had originally envisioned, I decided to go to the United States in the hope of gaining financial, material and personnel assistance from other zoos and zoologically based institutions.

My first real break through came from the Zoological Society of Florida in the early stages of 1994. This organization graciously allowed me to base my operations temporarily out of their offices and begin my outreach. It was not long before interest began to be generated and some small, but never the less important, donations started to come in. The major leap forward however, came from when I managed to scrape together my nickels and dimes to get to the 1994 AZA Conference based in Atlanta, GA. Here I gave an informal slide presentation and talk to a group of interested colleagues. Little did I know of the interest and of the snow-balling effect that this simple presentation would generate.

The first days of the new year saw the formation and legalization of Zoo Peru Inc. within the U.S. Within the months to come, Zoo Peru Inc. gained its 501(c)(3) status, with the whole purpose of the organization at this stage, being to assist the Quistococha Zoo in Iquitos, Peru.

Later that month, I was informed by my colleagues in Peru, that the zoos one and only giant river otter (*Pteronura brasiliensis*) was under attack by a female caiman, which unfortunately shared its exhibit. It was then that the first major breakthrough for the Quistococha Zoo was generated, as the Zoological Society of Philadelphia came to the rescue. Within days I found myself jetting back to Peru with enough finances to treat the giant river otter of his wounds, build a new caiman facility to house and relocate the zoo's 10 caiman, re-landscape and secure the river otter exhibit, and have enough money to live on for an entire month. It is amazing what you can do with U. S. \$ 1,200.00 in your pocket.

The next major headway came when I attended the "Zoos Committing to Conservation Conference" hosted by the Columbus Zoo in Columbus, OH in July of 1995. This unique conference format really seemed to bring together a exceptionally dedicated group of people, and once again I found myself seizing the moment and giving an impromptu talk on the situation at Quistococha. From this conference I gained more financial, moral and material support than what I ever thought possible. By the time the conference had concluded, I already had financial donations, material supplies on the way and the chance of having the future involvement of not only the Columbus Zoo itself, but also the Brevard Zoo in Melbourne, FL. This hectic pace of networking continued, with my attendance at both the AZA and AAZK conferences later that year. Once again these conferences also proved fruitful as I was able to generate more valuable and much needed support.



November saw my return to South America once again after receiving generous financial assistance from the Zoological Society of Philadelphia, the Philadelphia AAZK Chapter as well as the funds generated earlier in the year from the conference in Columbus. I was also extremely fortunate in gaining free air travel courtesy of Fourth Dimension Tours, Miami, FL.



**Shown above is the zoo's single giant river otter (*Pteronura brasiliensis*) feeding on a live fish in his exhibit which was renovated and landscaped in February of 1995. (Photo by Antony Taggart)**

Upon visiting the zoo I was not suprized to find that not only did we have new animal additions, but also quite a number of thefts during my absence. Unfortunately our gaint anteater (*Myrmecophaga tridactyla*) and brown-throated three-toed sloth (*Bradypus variegatus*) were two of many animals that were missing. This, although hard to get used to, is the unfortunate stem of reality down here in Iquitos at the present moment.

Within about 10 days of my arrival I was able to witness one of those rare sights that you just do not get to see too often, this being a jaguar birth. During my absence from Peru in the mid stages of last year, our female jaguar conceived from the male sharing her exhibit. These two cats, that came in nearly three years ago as cubs after being donated from the Admiral of the Peruvian Navy, were soon to continue the cycle of life themselves.

Like that of many of the exhibits at the zoo, the jaguar exhibit is old, poorly designed and offers very little mental or physical stimulation for the animals.



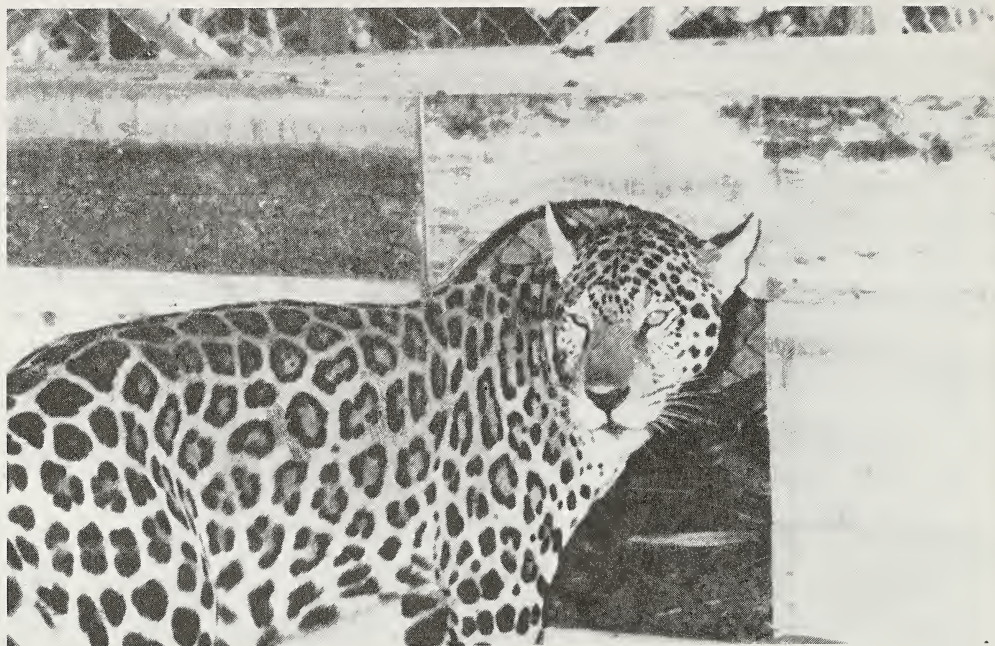
The more immediate and concerning question that faced us was; "Where were we going to place the female once she was about to give birth?" Because no one had recorded the date of likely conception, all we knew was that we did not have much time and that we had better get an exhibit built quickly. But Mother Nature beat us to the mark. On the 27th of November 1995, our female jaguar gave birth to the first of 1.1 cubs. Fortunately for the mother, I was there during her early stages of labor with the first cub and managed to get her off display and separated from the male sharing her exhibit. I still remember watching the female walk into her 1m x 2m x 1m (approx. 10' x 6.5' x 10') exhibit with the cub just beginning to come out. By the time she was in the exhibit the first cub had fully emerged. The second cub was born soon after. Once that it was established that the cubs were nursing well and would hopefully not need to be pulled, we began to put the finishing touches on the new jaguar facility. The new exhibit included a corridor system which would allow the female jaguar to wander through on her own accord and transfer the cub over from the old to the new facility.



**This photo shows the mid-construction stage of the new jaguar exhibit.** *(Photo by Antony Taggart)*

It was to the great advantage of the Quistococha and Zoo Peru Inc. that on 2 December 1995, we were joined by two staff members from the Columbus Zoo, and the Curator of the Brevard Zoo. During this two weeks that we had assistance from these zoological institutions, we were able to achieve a great deal towards enhancing the future development of the zoo. An updated animal inventory was established, and Zoo Peru Inc. staff members were trained in recording and maintaining animal records. These visiting zoo professionals generated a lot of ideas about how to improve the zoo's situation.





**After a complete investigation of her new quarters, the female jaguar pauses before moving her cubs from the old exhibit, through the transfer and into their new exhibit. (Photo by Antony Taggart)**



**The 1.1 jaguar cubs are shown sleeping peacefully in their new exhibit after being transferred from the old unit by their attentive mother. (Photo by Antony Taggart)**

Currently the situation of Zoo Peru Inc. in Iquitos is that we shall soon have our non-profit status in Peru, and will be submitting a proposal to take control of the Quistococha Zoo to the regional government. Until this can be accomplished, animals will continue to be poached off zoo property and confiscated animals will continue to come in. It is the aim of Zoo Peru, Inc. upon obtaining control of the zoo and the grounds that it is situated on, to make the Quistococha Zoo one of the most powerful conservational and educational tools within South America. The road so far has not always been easy and at times it feels like you are going in reverse, but the chance of success through a team effort certainly outweighs any thoughts of failure.

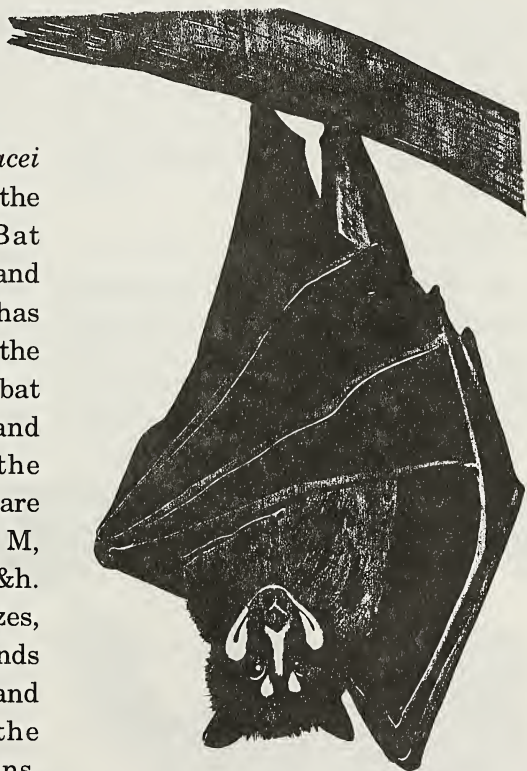
Our thanks go out again to all of those groups and individuals who have supported this project either financially, morally or through material assistance over the past two years. It is thanks to you people, and you alone, that the Quistococha Zoo has now come this far.

Anyone reading this article who would like more information on the Quistococha Zoo, please do not hesitate in reaching me at the following address: A. Taggart, Loreto 680, Iquitos, Peru; Fax: 51- 94 - 24 -1389.

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## Sulawesi Fruit Bat T-Shirts Available

A T-shirt with a *Styloctenium wallacei* in three colors on the front and the words "Sulawesi Fruit Bat Conservation Project" in English and Indonesian surrounding the bat has been produced to assist in funding the study of human predation on fruit bat populations in Sulawesi. Scott and Kirsty Zahnke-Heinrichs are the researchers on this project. Shirts are 100% cotton in preshrunk sizes S, M, L, and XL. They are \$12 plus \$3 s&h. To order, send quantity desired, sizes, and a check or money order (U.S. funds only, please) made payable to Scott and Kristy Zahnke-Heinrichs at the following address: 5721 W. Higgins, Chicago, IL 60630. If you have questions, their telephone/fax is (312) 685-5747





# Chapter News Notes

## Rio Grande AAZK Chapter

Hello from the High Mesa. We of the Rio Grande AAZK Chapter figured it was time to let you know that we exist and that we're doing well. In our first four months we have established ourselves with 14 members (a small but enthusiastic group), had a Keeper Information Table at the zoo's Earth Day festivities - which included a "Meet the Keeper" sign and samples of animal feed (very popular, by the way), and sold flowers at the zoo on Mother's Day as a fundraiser.

We gained acknowledgment and support from our administration with whom we are working closely. They have added to our experience by providing continuing education and by increasing our involvement in the growth and development of our biological park.

For the future we are discussing possible fundraisers (isn't everyone?); improvements we can help with around the zoo such as enrichment items; acquisition of books to increase

our libraries in each animal area; and our role in assisting the Albuquerque Biological Park, which includes our zoo, in hosting the 1997 National AZA conference (Hope to see you there!).

If anyone has any advice or ideas for fledgling Chapters, please write to be care of the Albuquerque Biological Park, 903 Tenth St., S.W., Albuquerque, NM 87102.

We are also pleased to unveil our Chapter logo which was designed by Chapter members Gregg and Stacey Sekscienski.

—Bill Pentler, Sr. Keeper / Mammals and  
Rio Grande Chapter Liaison

## Greater Baltimore AAZK Chapter

In May we were lucky enough to have Andy Lodge speak at the Baltimore Zoo. We passed the hat and collected a good donation for Andy. He also did a brisk business in selling T-shirts, coffee mugs and books. His talk was excellent and everyone really looked forward to our Bowling for Rhinos event which was held on 9 July.

Our Chapter offered a \$500.00 grant to any department in the zoo that gave us a proposal for improving their area.

We received three proposals and decided to split the money evenly between two of them. The recipients were the Mammal Dept. for a wheelbarrow to use in the farmyard area of the Maryland Wilderness, and to a joint proposal by Horticulture, Maintenance, and the Bird Dept. for Biologs® to use around the farm pond



to prevent erosion. We hope to do this again next year and to have more proposals from the departments.

—Rick Jones, Chapter Liaison

### **Topeka AAZK Chapter**

Hello from Topeka! Our Bowling for Rhinos event was a big success. We were able to raise \$881.75 due to the hard work of Jennifer Agee, Warren Waters, and all the other volunteers who helped round up prizes. We are looking forward to next year.

The Chapter has experienced a recent change in its officers. We would like to wish Darrell Agee good luck at his new job at the Kansas City Zoo. With his resignation, Warren Waters became the Chapter's new President and Dina Signorelli has been appointed to fill the position of Vice-president, formerly held by Warren.

The Chapter would also like to extend its best wishes to Max and to Barb Grisham. Max is Kansas' first gorilla that was recently transferred to the Santa Barbara Zoo where Barb is his keeper. We hope Barb enjoyed her stay at the Holidome of Topeka (courtesy of the Topeka AAZK Chapter) and can someday get Max to go out on exhibit without keeping his foot in the door!

—Michael Davis, Chapter Liaison

### **San Diego Zoo AAZK Chapter**

It's already summer and how this year has flown by. Our Bowling for Rhinos fundraiser was a huge success. We raised over \$7,000.00. A big thanks goes out to the Los Angeles Zoo and their AAZK Chapter for joining us to raise over \$2,000.00. We also want to

thank Tony and Julie Nichols for organizing the raffle (which was outstanding), and Ann Dahl and Ron Ringer for organizing the event. Without donations and volunteers we would not have much to celebrate about, so of course our appreciation goes out to them as well.

Our new officers for 1996 are:

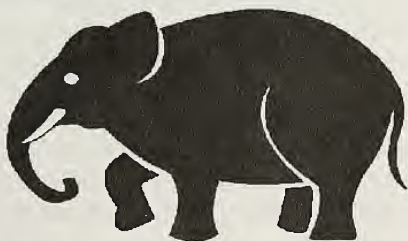
President.....Nicki Boyd  
Vice President.....Trisha Olow  
Treasurer.....Vickie Steele  
Secretary.....Joann Haddad

Our newest Board Member is Janet Spevak.

Our membership has been maintained thanks to our newsletter *The Keeper*, and we want to thank everyone for their support. Our latest edition should be printed by the time this is in the next *AKF*. We recently moved to a new printer so we apologize for the delay.

Our local Chapter has been treated to many wonderful speakers this year and we want to thank Nancy Caine, Ph.D. for her talk on Lessons Learned from the Natural History of Marmosets and Tamarins; and Diane Ledder and Jackie Ogden, Ph.D., both from the Zoological Society of San Diego, for their talk on the Guyana Project currently underway. We hope everyone has a great summer.

—Nicki Boyd, Chapter President





*Institutions wishing to advertise employment opportunities are asked to send pertinent data by **the 10th of each month** to: Opportunity Knocks/AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing date for positions available and when setting these dates keep in mind that because of bulk-mail, most readers do not receive the AKF until the middle of the month or later. There is no charge for this service and phone-in or fax listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is (913) 273-1980.*

**ELEPHANT PROGRAM SUPERVISOR/Knoxville Zoological Garden...**requires experience working with elephants in a free contact system, excellent personnel management and communication skills. Knoxville will be establishing a program of protected contact from an existing free contact system over the next several years. Currently holding 1.3 African elephants, Knoxville has plans for a new facility in the masterplan. The program supervisor will oversee and coordinate animal operant conditioning, barn management, and personnel development. Will be expected to attend meetings pertinent to the profession and be staff representative for the Elephant SSP. Excellent benefits package, salary commensurate with experience. Interested parties should send resumé and references to: Becky Hargis, Mammal Curator, Knoxville Zoo, P.O. Box 6040, Knoxville, TN 37914, Phone: (423) 637-5331, ext. 321.

**BIRD KEEPER WANTED**...with wide experience in softbills, gamebirds, cranes, etc. Experienced in developing diets, disease control, record keeping, ARKS & SPARKS desirable. Willing to undertake studbook management. Residence provided. Written contact is faster at our US facilities down the road: David Hancock, 1431 Harrison Ave., Blaine, WA 98230; 1-800-938-1114; Fax 800-983-2262.

**ZOOKEEPER I**...the North Carolina Zoological Park is accepting resumé from keepers for anticipated openings in the African section of the zoo. For one position, experience with birds and herps is preferred, but the incumbent will work with a variety of mammals as well. The other position involves working with giraffe, zebra, warthog, ostrich, chimps, lions and baboons. A degree in a biological science, as well as experience at an accredited zoo are preferred. Starting salary is \$16,760, increasing to \$17,597 upon satisfactory completion of probation, plus benefits. Send resumé and cover letter **by 30 August 1996** to: Human Resources, North Carolina Zoological Park, 4401 Zoo Parkway, Asheboro, NC 27203, Attention: Zookeeper I; Fax (910) 879-2891.

**ZOO KEEPERS WANTED**...Lion Country Safari, Inc. in West Palm Beach, FL is currently seeking two (2) experienced Zoo Keepers. Preference will be given to those with a degree in biological sciences and experience in a recognized zoological facility. We are also prepared to train candidates with a minimum high school education and experience in a related field. Experience with birds and/or reptiles would be an asset. Lion Country Safari offers an excellent benefit package and salary commensurate with education and experience. Please send resumé, including three (3) references and social security number to: Ms. Cathy Toomey, Personnel manager, Lion Country Safari, Inc., P.O. Box 16066, West Palm Beach, FL 33416-6066.

**ZOO DIRECTOR**...responsible supervisory and administrative work in directly all activities of the Capron Park Zoo under the policy direction of the Park Commission and under the administrative direction of the Mayor. Performs highly responsible duties requiring the exercise of considerable independent judgment in planing projects and activities for the zoo. Acts as technical advisor to the Park Commission recommending policies and procedures for the zoo. Directs the operations and activities of the zoo and rain forest; directs the planning, design, construction, operation, maintenance of the zoo. Bachelor's degree in zoology, animal science or biology, Master's degree preferred;

five years of experience in a zoological facility, at least two of which have been in a supervisory capacity; or any equivalent combination of education and experience. Extensive knowledge of objectives, principles and methods, techniques of modern zoo administration, and of the function, design, operation and maintenance of zoo facilities. Mail or fax resumé (Fax# 508-222-3046) or apply to the City of Attleboro Personnel Dept., 77 Park St., Attleboro, MA 02703. Position open until filled.

**KEEPER**...requires a degree and one year of experience with captive exotic animals. Two or more years of experience may substitute for the degree. Responsibilities include all aspects of daily animal care, routine exhibit maintenance and public education. Two positions are available: Bird Keeper and Open Relief Keeper. To apply send cover letter and resumé to: Human Resources, The Philadelphia Zoo, 3400 West Girard Ave., Philadelphia, PA 19104.

**ANIMAL CARE SPECIALIST SUPERVISOR**...Requires two years of college level course work, two years experience in the care, handling, training of wild/exotic animals. Excellent presentation skills and experience with outreach or educational programs. Must be an outgoing individual who is able to motivate/supervise others and work as a team member. Please send resumé to: Human Resource Dept., Six Flags Magic Mountain, P.O. Box 5500, Valencia, CA 91386, Attn: Animal Care Specialist Supervisor or call (805) 255-4770 for more information. EOE.

**CHILDREN'S ZOO SUPERVISOR**/Gladys Porter Zoo...full-time, working position available for qualified applicants. Additional staff includes experienced nursery supervisor and two (2) keepers. Collection includes 75-plus animals consisting of small carnivores and primates, barnyard/petting area, nursery and birds. Prior keeper experience required; prior supervisory and/or educational experience preferred. Must be able to relocate and start as soon as possible. Salary in the mid-teens, plus benefits. Send resumé to: Michelle Willette Frahm, D.V.M., Gladys Porter Zoo, 500 Ringgold St., Brownsville, TX 78520 or fax to (210) 541-4940 or send by e-mail to vet@gpz.hiline.net.

*The following two (2) positions are available with S & R Productions, P.O. Box 4082, Las Vegas, NV 89127-0082. If interested submit resumé and letter of interest to address given above.*

**ANIMAL CARE COORDINATOR**...Requires degree in animal management related field, experience in the care/handling/training of wild/exotic animals, two years supervisory experience, and excellent oral/written/interpersonal skills. Responsible for daily animal care, observations, exhibit maintenance, staff supervision.

**ANIMAL CARE SPECIALIST SUPERVISOR**...requires two years of college-level course work, two years experience in the care/handling/training of wild/exotic animals, excellent presentation skills, ability to motivate/supervise others and work as a team member.

**ANIMAL KEEPER**...prefer Biology or related 4-year degree, paid zookeeping or volunteer experience. Will care for a variety of species. Elephant experience desirable. Responsibilities include feeding, health maintenance, exhibit care, interaction with the public. Send resumé to: Julia Parker, Animal Care Supervisor, Santa Barbara Zoological Gardens, 500 Ninos Dr., Santa Barbara, CA 93103.

*The following three (3) positions are available at the El Paso Zoo. Official City application due back by 4:00 p.m. on 4 October 1996. For all three positions contact: Kate Shaughnessy, City of El Paso Personnel Dept., 2 Civic Center Plaza, third floor, El Paso, TX 79901-1196. (915) 541-4085.*



**ZOO DIRECTOR**...requires Bachelors in Business or Public Administration, Biological Sciences or related field, plus eight years of progressively responsible experience in zoo operation and administration, including four years as a second-level supervisor of animal care or other operational unit with medium-to-large staff. Salary \$50,424.00 to \$80,158.00.

**ZOO DEPUTY DIRECTOR**...requires DVM or VMD plus six years in the practice of veterinary medicine including four years of comprehensive and varied experience in exotic animal medicine and surgery, and two years in program administration and management. Salary \$47,506.00 to \$75,481.00.

**ZOO VETERINARIAN**...requires DVM or VMD plus three years experience in the practice of veterinary medicine, including two years of comprehensive and varied experience in exotic animal medicine and surgery. Salary \$38,434.00 to \$52,539.00.

**ELEPHANT KEEPER**...requires high school diploma and at least one year's paid experience in the care/maintenance of elephants. Must possess interpersonal skills, accept direction and work as a team member in a free contact (females) and protected contact (males) elephant program. Salary range \$1,300.00 to \$1,507.00 monthly with excellent benefits. **Position closes Friday, 13 September 1996.** Please submit resumé to: Human Resource Dept., City of Fort Worth, 1000 Throckmorton - Lower Level, Fort Worth, TX 76102. Attn: Wanda Smallwood.

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## Information Please

Work on a supplement to the 1994/1995 North American River Otter Husbandry Notebook is currently underway. I am looking for information in the following areas: enrichment, common health problems, bladder and uteran infections in females, normal blood values and hormone levels, target training, detailed diet analysis, and exhibit design, particularly problem areas. Your information could help solve someone else's problem! Please send as much detail as possible to: Jan Reed-Smith, John Ball Zoo, 1300 W. Fulton, Grand Rapids, MI (49504-4301) or e-mail - jrsotter@aol.com.

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We currently house 0.1.1 rheas (*Rhea americana*). They have laid over one dozen eggs. The rhea that is unsexed is very aggressive. We would appreciate any information on them, such as their behavior, how to sex them, their gestation, has anyone had successful hatchings, were the eggs separated, were the parents separated, diet, and enrichment. Anything would be helpful! Please send information to: Suzanne Smith, ZooQuarium, 674 Rt. 28, W. Yarmouth, MA 02673 or call (508) 775-8883.

# **AAZK Membership Application** *check here if renewal [    ]*

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State/Province \_\_\_\_\_ Zip \_\_\_\_\_

## **U.S. Members**

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**\$30.00 Professional**  
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☐

**\$25.00 Affiliate**  
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**\$25.00 Associate**  
*Those not connected with  
an animal facility*

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**\$50.00 or up - Individuals**  
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☐

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*Organizations/Institutions  
(requires Board approval)*

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**International Members**  
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*All members outside U.S. &  
Canada regardless of category*

## **Canadian Members**

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**\$35.00 Professional**  
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*Other staff & volunteers*

☐

**\$30.00 Associate**  
*Those not connected with  
an animal facility*

☐

**\$55 or up - Individuals**  
**Contributing/Canada**

☐

**\$75.00 or up**  
**Institutional/Canada**  
*Organizations/Institutions  
(requires Board approval)*

☐

**Library Only**  
**\$25.00 Library**  
*Available only to public  
& university libraries*

Zoo Affiliation (if any) \_\_\_\_\_

Zoo Address \_\_\_\_\_

Title \_\_\_\_\_

Work Area \_\_\_\_\_

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**My check is enclosed (AAZK, Inc.)**

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**Please charge my credit card**

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Name on card \_\_\_\_\_ Expiration date \_\_\_\_\_

Signature \_\_\_\_\_

Mail this application to: AAZK Administrative Offices, Topeka Zoo, 635 S. W. Gage Blvd., Topeka, KS 66606-2066. Make checks/money orders payable to AAZK, Inc. Must be in U.S. FUNDS ONLY. Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.



**American Association  
of Zoo Keepers, Inc.  
635 S.W. Gage Blvd.  
Topeka, KS 66606-2066  
U.S.A.**

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# ANIMAL KEEPERS' FORUM



The Journal of the American  
Association of Zoo Keepers, Inc.

**SEPTEMBER 1996**



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**September 1996**

**Vol. 23, No. 8**

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#### **AAZK PUBLICATIONS - CONTINUING DATA COLLECTION**

**Zoo Infant Development Project** - Teri Maas-Anger/Maggie Liguori, Philadelphia Zoo (Birds/Nonpasserines); Jennifer

Hackshaw, Lowry Park Zoo and Suzanne Chacon, Costa Rica (Birds/passerines); Jeanne Stevens, Newark Museum

Mini-Zoo (Reptiles); Linelle Lone, Denver Zoo (Amphibians)

**Diet Notebook, Mammals, Vol. II** - Susan Bunn Spencer, Rockford, MI

**Incubation Notebook Project** - Scott Tidmus, Sedgewick County Zoo, Wichita, KS

**Exhibit Design Resource Notebook** - Mike Demlong, The Phoenix Zoo, Phoenix, AZ

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## About the Cover.....

*This month's cover features the Asian Lion (*Panthera leo persica*). This species is rare in captivity and exists primarily as a population of several hundred in the Gir Forest (Kathaiwar, India), a protected area. It remains endangered however, because the Gir Forest was until recently overgrazed by domestic cattle and the lions could find very little wild prey themselves. Currently the Indian government is moving villages out of the Gir Forest, and grazing has been reduced and is now more controlled. The cover was drawn by Ric Urban, a keeper in the Aviculture Dept. at the Houston Zoo and current AAZK President. Thanks, Ric!*

## Information for Contributors

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Articles may be submitted on disk by arrangement with the Editor. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy finish black and white photos **only are accepted**. Color slides should be converted to black and white prints (minimum size 3" x 5" [8cm x 14cm] ) before submission. Clearly marked captions should accompany photos. Please list photo credit on back of photo.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

**Deadline for each regular issue is the 10th of the preceding month. Dedicated issues may have separate deadline dates and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the AKF staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$3.00 each.

# ***Scoops & Scuttlebutt***



## **Board Election Upcoming**

Are you thinking "What can I do for AAZK?". Why not become more active in AAZK by becoming a Board member or nominate some one else to run for a Board position. There will be three positions open - those held by Ric Urban (Houston Zoo), and Janet McCoy and Michael Illig (Metro Washington Park Zoo) whose terms will expire at the close of the 1997 National Conference in Houston. New Board Members will serve four-year terms from the close of the 1997 National conference until the conclusion of the 2001 National Conference. Election information and Nomination Forms appeared in the July 1996 issue of *AKF* and will be published again in the November 1996 issue.

## **AAZK NEC Position Open**

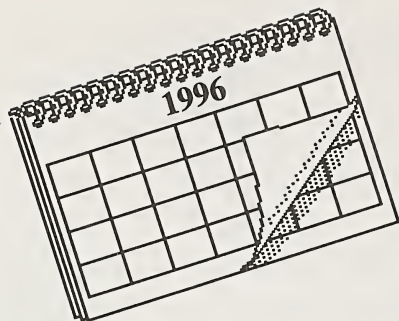
There is a position available on the Nominations and Elections committee. Any AAZK member continuing "in good standing" who wishes to fill this vacancy is eligible. A committee member is responsible for assisting the Chair in coordinating the election process of the AAZK Board of Directors and the President and Vice-President. Must have good reporting skills and computer literacy is helpful.

If interested, send resumé or for more information contact Sheri Leavitt, NEC Chair, Houston Zoological Gardens, Children's Zoo, 1513 N. MacGregor Way, Houston, TX 77030.

## **Thanks Go Out to the Columbus Zoo**

For the second consecutive year the Columbus Zoo has graciously provided underwriting for the printing of the 1996 Animal Data Transfer Forms (ADT). The AAZK Board of Directors, the AAZK staff and membership wish to express their sincere appreciation for this assistance on a project which is both useful and important to the entire zoological community. The utilization of the ADT Forms assures that vital information on an animal, its health, diet, breeding history, etc. is passed along to its new institution and staff when the animal is shipped. The ADT Form had its beginnings in 1978 and thousands of forms have been used since its inception. Forms are provided free of charge to zoological institutions as a professional service of AAZK, Inc. AAZK also wishes to thank member Beth Pohl who has been instrumental in securing this funding for the project. Anyone interested in obtaining a supply of ADT Forms should contact: Bernie Feldman at the Burnet Park Zoo, 1 Conservation Place, Syracuse, NY 13204.





# Coming Events

**12th Annual International ChimpanZoo Conference - Communication and Respect: A New Perspective of Hand Rearing Chimpanzees** - September 28 - October 2, 1996, hosted by the Sedgwick County Zoo, Wichita, KS. Opening address to be given by Dr. Terry Maple, Director Zoo Atlanta. Feature speakers to include: Doctors Jane Goodall, Kim Bard of Yerkes and Aleccia A. Lilly of LABS. Workshops will include: a new perspective for hand-rearing chimpanzees and primates without moms. For more information contact: Dr. Virginia Landau, Director of ChimpanZoo (520) 621-4785, 800 E. University Blvd., RM 308, Tucson, AZ 85721.

**Second Annual Red Panda SSP Keeper Training Workshop** - October 4-6, 1996 at Knoxville Zoological Gardens, Knoxville, TN. For further information and registration materials, contact Greta McMillan, Conservation Research Curator, P. O. Box 6040, Knoxville, TN 37914 - (423) 637-5331 ext. 380, fax (423) 637-1943, e-mail: knoxzoo@utkux.utk.edu

**Association of Zoological Horticulture International Conference** - October 4-12, 1996 in Greensboro, NC. For further information contact: Virginia Wall, North Carolina Zoological Park, 4401 Zoo Pkwy., Asheboro, NC 27203; (910) 879-7400.

**Association of Zoo Veterinary Technicians 16th Annual Conference** - October 29 - November 1, 1996 in Puerto Vallarta, Mexico. Will include sessions on reptile, avian, primate, exotic hoofstock and aquatic medicine, immobilization, hematology, clinical pathology, hospital techniques and case reports. There will also be a wet-lab. For more information contact: Jenni Jenkins, LVT, National Aquarium at Baltimore (410) 659-4256; fax (410) 576-1080. For membership information contact Lisa Kolbach, LVT at White Oak Conservation Center at (904) 225-3396.

**17th Annual Elephant Managers Workshop** - January 24-27, 1997 in Jacksonville, FL. Hosted by Jacksonville Zoological Gardens. For further information, contact: Steven M. Wing, Curator of Mammals, Jacksonville Zoological Gardens, 8605 Zoo Parkway, Jacksonville, FL 32218 (904) 757-4463 or (904) 757-4315 [fax].

# Message From the President

Greetings from the Lone Star State!

Conference time is upon us. In a few weeks we will be gathering in Michigan for the 1996 AAZK National Conference. The folks in Detroit are making those last minute preparations for a wonderful conference.

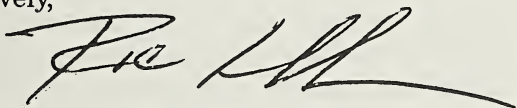
Conferences are one of the most effective ways in our profession to communicate and exchange information. Much of the information is never printed or formally presented. It is exchanged during small group discussions and workshops. The face-to-face meetings are what make conferences unique and so important.

In Detroit delegates will have the opportunity to select the site of the 1999 AAZK National Conference. As Chapters, now is the time to make a bid to host the conference in your city. I won't deceive you. It is a lot of hard work that in the long run will yield great dividends. For more information contact Ed Hansen.

Nominations are being accepted for the 1997 Board of Directors elections. Take a moment and look at the duties and responsibilities of the Board. Talk to current or former Board members and ask questions. This is a challenging position that will affect the direction of this Association. (*Editor's note: information on the election and nomination forms may be found in the July 1996 issue of AKF or contact Administrative Offices in Topeka.*)

I am looking forward to seeing the delegates in Detroit. Watch for the Houston delegation.

Respectively,



Ric Urban, President, AAZK, Inc.  
Houston, TX

## ATTENTION CHAPTERS

As of publication deadline, I have not received any inquiries from Chapters in regards to hosting the 1998 Annual Conference. Conferences are vital to the health of your Association. Any Chapter interested may contact me through the Administrative Offices for further details on the bid process.

Ed Hansen, Executive Director



## Animal Behavior Concerns & Solutions

A Question and Answer Forum for the Zoo Professional

By Diana Guerrero

Independent Behavior Consultant, Ark Animals of California, San Diego, CA

### **BEHAVIOR EVALUATION: Elephant** (*Elephas maximus indicus*)

Zoo, Elephant Department

#### **QUESTION:**

Our facility has converted over to a Protected Contact Management system with our elephants. Recently there has been increased aggression in the herd. Both humans and elephants are involved. A predominant amount centers around one female. What kind of suggestions do you have?

#### **BACKGROUND:**

The conversion to "protected" contact from "free contact" at this facility has involved shifting of animals, staff members, management, and design. In essence, there is still a state of instability in the department. Over the past two years there has been a constant change in personnel and the herd dynamics appear to be influenced by the changes.

Demands for husbandry work, exhibit maintenance, show performance, and training have escalated and staff is constantly challenged to meet the daily scheduled workload requirements. "Always rushed" would be a good description.

The facility allows for the animals to be separated in the barn as well as in several other areas. Separation can be done but behavior breaks down under slight stress scenarios. The main animal involved may only be worked by certain individuals and has been restricted from other training procedures due to her aggression.

#### **PROBLEM:**

One animal has progressively become more aggressive toward keeper staff. At first, one person seemed to be the target but it has progressed to injury of another. This animal also experiences aggression from other herd members and is often displaced and has been crushed against exhibit barriers and hit or kicked by other herd members. Other repercussions include breakdown of behaviors such as routine stationing, screaming, and stress overload (nonresponsive).

## **ANIMAL PROFILE:**

The animal who is aggressing towards keeper staff and who is being aggressed on by other herd members is a hypersensitive individual (see **Elephant Manager's Journal**, Fall 1995 Issue for social style descriptions). She has a bond with another herd member and seeks reassurance from that individual. When stressed (Often), she will break station, scream, or not respond to commands. She has also engaged in stalking behavior, displacement of aggression, overt aggression, and has been displaced or crushed into exhibit barriers by her conspecifics.

## **OTHER NOTATIONS:**

Further background seems to support the fear/avoidance reaction based on experiences which include: aggressive behavior from conspecifics; low rank in herd; inconsistency in handling and training criteria; aversive reaction to negative voice commands and raised tones; frustration or confusion in training scenarios. In addition, the animal may have learned to choose to aggress in order to terminate interactions with certain humans.

## **PROBLEM BREAKDOWN:**

Behavior can be broken down into inconsistencies in handling, aversion to aversive keeper staff, lack of desensitization, lack of confidence in handlers and in social status, fear/overt aggression, stress related behavior.

## **APPROACHES:**

This particular scenario has escalated into one that needs to be addressed immediately. Ideally it would have been corrected in the early stages. The animal needs more training work and activity to overcome the problem. This should be done in slow, small, systematic steps with lots of encouragement, and even tones of voice. Time allocation needs to be made so this animal is not rushed and sessions are completed successfully. All sessions should begin and end positively and be kept short. Each session should be delineated clearly between staff before training commences.

The routine prevents extensive training to be done due to a shortage of keeper staff and extremely heavy demands on the area. Recommend that two individuals be assigned to work with this animal through the problematic time until new behaviors can be introduced.

## **ACTION OPTIONS:**

The following suggestions are recommendations towards solving the problems:

- a) Assign specific trainers to animal
- b) Eliminate aversive tones and raised voices



- c) Work animal with slow clear steps delineated before any session transpires
- d) Work with intermittent reinforcement
- e) Increase verbal encouragement
- f) Maintain consistency in established behaviors
- g) Introduce new simple behaviors
- h) Work sessions for desensitization (and only desensitization not other behaviors)
- i) Maintain station control of all animals prior to any movement or training
- j) Introduce variables in stationing behavior for desensitization
- k) Anticipate problematic scenarios before they transpire and avoid setting up possible stress situations between animals

## **BRIEF DESCRIPTION OF ACTION STEPS:**

Initially stick to regular routine and prioritize work with this individual. Perhaps management should look into hiring training staff since work overload prevents faster progress from being made. Job description does not appear to have training or show responsibilities listed and it appears that other departments at the institution have specific training/show personnel. At any rate, two individuals with different days off and overlap work days should team train for consistency and faster initial progress.

Training should be consistent and focus on "short & sweet" frequent sessions. Behavior criteria should be sharpened and when the animal makes a mistake or hesitates, a calm and even tone of voice should be used. If the animal refuses to respond either take a short time-out and try another behavior or ask for a simple behavior to obtain success and begin again. No repetition should be done on a behavior that has been exhibited successfully and to proper criteria — ask once and move on.

The individual does behaviors well when asked, so nuances or variations can be taught without too much additional stress. Small new behaviors could be introduced after a week or two of consistent performance.

Training criteria should be on intermittent reinforcement. Bonus reinforcement should only be used when animal exhibits high criteria of behavior, or when responding in the next level of distraction (in desensitization work). Initially, simple behaviors or husbandry behaviors would be the best to work on in higher levels of distraction. Bonus those first successes heavily and end the session.

When shifting or preparing for training sessions be sure to place animals in areas where displacement activity will not be easy to exert. For example, do not place a higher ranked animal between the enclosure to be worked and the female you are trying to stabilize. If she refuses to pass the dominant animal you sabotage the effort. Also make sure all animals are stationed before you attempt to move any.

Eventually variations in the release should be attempted. Once desensitization in a new area is successful and the animal is performing well with few breakdowns in behavior you can start variations. For instance, three animals can be released while two remain in the barn (bonded pair with hypersensitive female). Also the reverse, two animals released (bonded pair with hypersensitive female) then the other three, and other small variations. The facility has the design to do this and if this desensitization work is done it will increase stability in other stress scenarios and with the other herd members.

**Please note:** Extinguishing the aggression is possible but due to various skill levels and variables that is beyond the scope of this column. On-site consultations are available should you require that type of assistance.

### *Next month: Nursery Behavior - Felids*

*(About the Author: Since 1978 Diana has been active both in the U. S. and England working with zoos, private collections, an oceanarium, a marine aquarium, and other animal-related organizations involving captive wildlife. She has a broad base of animal experience involving movie & television training, zookeeping, show performances with live animals, education, behavior management, modification and enrichment, rescue and rehabilitation as well as captive breeding and management of endangered species. She currently works as an Animal Behavior Consultant and Trainer for Ark Animals of California working with both exotic and domestic animals. She has authored numerous articles on animal behavior and training. If you have questions for Diana, you may contact her at 1-800-818-7387 or visit her Home Page at <http://www.ni.net/brookhouse.com>)*

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## **AAZK Announces New Professional & Contributing Members**

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Matthew J. Schwoebel, **Baltimore Zoo (MD)**; Carolyn Massicott, **Stone Mountain Park Wildlife (GA)**; Jeffrey A. Carter, **Jacksonville Zoological Gardens (FL)**; Julie Reynolds, **Discovery Island (FL)**; Marnie Gire, Randy Gire and Margo McKnight, **Busch Gardens (FL)**; Kimberly Gail Bailey, **Nashville Zoo (TN)**; Bonnie Jo Rogers and Sharon Tackett, **Jackson Zoological Park (MS)**; Staci Goforth, **Mesker Park Zoo (IN)**; Tina Starr, **Sea World (OH)**; Nicola L. Livingston, **Indianapolis Zoo (IN)**; Jeff Mitchell, **John G. Shedd Aquarium (IL)**; Andrew Stadther and Michael Mihelich, **Detroit Zoological Institute (MI)**; Jenny Kempken, Elizabeth A. Christmas, Beth Roszak, Tracey Dolphin, Laurie A. Talakowski, Patricia Lepianka, Patricia A. Forget, Earl Conteh-Morgan, Carol Deer, Claire Hubmann, and Jacqui Mundell-Wachowiak, **Milwaukee County Zoological Gardens**; Christopher Mascarella and Amy K. Maehler, **Phillips Park Zoo (IL)**; Amy Hohulin, **Miller Park Zoo (IL)**; Tom Weaver, **Grand Island Heritage Zoo (NE)**; Peter Pruett, **Tulsa Zoo (OK)**; Kathryn Fowler and Meaghan McCeig, **Caldwell Zoo (TX)**; Christy Mann, **Gladys Porter Zoo (TX)**; Carrie Heisler Hill, **Hogle Zoo (UT)**; Eric D. Jones, **Albuquerque Biological Park (NM)**; Steven Schenk, **Tropicana Hotel (NV)**; Deborah Jones, **Zoological Society of San Diego (CA)**; Jackie Buck, **Valley Zoo (Edmonton, Alberta)**.

### **Renewing Contributing Members**

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The Lube Foundation, Inc., Gainesville, FL  
Charles H. Hoessle, Director,  
St. Louis Zoological Park, St. Louis, MO  
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# My Plans For The Future

By Anna Merz, Founder and Patron  
*Ngare Sergoi Rhino Sanctuary/Lewa Wildlife Conservancy*

It is more than a year now since I realized, and first mentioned to Ian and Jane, that increasing age, arthritis and lack of agility, meant a re-thinking of my life style. Age and lack of agility I cannot do too much about but it does mean that watching rhinos on foot and many near misses with elephants are providing me with more excitements than even I appreciate. Arthritis I can do something about if I stop the main cause of my troubles which seems to be forty years of driving heavy 4 wheel drives over lamentable roads of Africa or virtual absence thereof. So in March, having discussed the matter with Ian and Jane, I went down to South Africa with the idea of finding myself a little cottage on the coast to which I might retire.



What actually happened was not at all what I anticipated. But it has made me very happy. I met Clive Walker, the South African rhino expert and internationally known wildlife artist and his wife Conita. Clive is Chairman of the Wilderness Trust and the Rhino and Elephant Foundation; he is also manager of the Lapalala Rhino Sanctuary. His wife Conita has,

like me, raised a baby rhino and is now raising and rehabilitating a young hippo. Clive is also thinking of partial retirement and he put to me a proposition which I found quite irresistible— that I should join forces with him and help him to create a rhino museum. The more I thought about this and discussed it with Clive, the more sense it made. I would hopefully be doing something still for rhinos but more within my present physical capacities. I would also be living somewhere where the physical side of life is a lot easier, good roads and so on.

Those of you who have visited with me here will understand me when I say that Lewa is truly beautiful and that life here is unendingly exciting and demanding. But, it is not quite the most suitable place to grow old in. So it seems to Clive, the Wilderness Trust and I that a museum, named for my beloved Samia, could be a major tool in creating awareness of rhinos, their lives, their evolutionary history, their zoology, their behavior, and their history in art and literature. Also included would be every aspect of the trade in horn which is their undoing. And not just the African rhinos but all three species of Asian rhino as well; the Indian, the Javan and the Sumatran would be featured. Clive is highly active in environmental education and the museum will be situated close to both the Lapalala Rhino Sanctuary and the Lapalala Wilderness School. It will be in

the center of an area three hours drive from Johannesburg. Both of us believe that its educational potential will be enormous and that we can make it into a potent tool for rhino protection and appreciation.

Personally I feel that this is the best way in which I can perpetuate Samia's memory and say thank you to her for eleven wonderful years of enjoying her love, trust and friendship and for the brief joy her baby gave me.

Early this year my friend, the writer Cynthia Salvadori, edited and put onto a computer file all my black rhino observations taken over a period of thirteen years. This information is now with another South African rhino expert, Dr. Eugene Joubert of the University of Pretoria. I hope he may be able to bring some useful information about black rhino behavior out of it all because I have no idea how to analyze it, nor do I understand computers.

Here on Lewa our work continues and progresses. At the end of February we had the great pleasure of welcoming the winners of the "1995 Bowling for Rhinos", Katrina Osborne with her friend Jennifer and Ken Smith with his son Douglas. We had so many laughs and I do hope they enjoyed coming as much as I enjoyed them being here. The health care clinic built by Janet and Spencer Gelsthorpe and their team of volunteers from Guernsey is virtually finished and we owe both them, and the wonderful people in America who have sent supplies for it, a huge debt of gratitude. We hope it will be functional by August under the supervision of Dr. Marjorie Harmon.

Our April rains virtually failed again but the female black rhino calf born to Juniper in January continues to make good progress. A female calf was also born to the young white rhino cow Ntombele who came to us from Natal; this is also her first calf. If drought conditions continue we shall shortly have to supplement all lactating females with lucerne, some are already getting it.

In May, tragedy struck twice. The Chairman of our Board of Directors, Nigel Sandys-Lumedaine, lost his only son Nyles, in a car accident. Nyles was well known to all of us here and loved for his humor, his willingness to help with any project on hand and his enthusiasm. We extend to Nigel our sorrow and sympathy and our appreciation for his life.

On the night before my return from three weeks in Madagascar Shaba, the female black rhino well known to all my guests for her regular appearances near house, was killed by Kenu in the valley below. I mourn her loss; she also was my friend and this time there was no doubt, as with Samia, regarding Kenu's guilt. He fought and killed her and to add to our sorrow she was virtually full term with a female calf, his. Why is he such a violent animal? I do not know. Rhinos differ as much in personality as do people and elephants. And life for Kenu has not been easy, he has no ears, only two holes in his head; again we don't know why, hyenas or genetics are the most likely possibilities. But without protection, a lot of dirt may get into his ears and cause him pain and suffering. Also, when captured he was the sole survivor of a once large population



of rhinos; what effect has this had upon him? Again the answer is that I don't know but it provides much food for thought, as when Jane Goodall found one of her chimps was a cannibal. But one thing is certain and that is Kenu is now a proven danger to his own species and thus last weekend the K.W.S. vet came up and darted him and he is now in one of our holding pens pending the K.W.S. decision as to what to do with him.

As some of you may remember last year I went on a rafting holiday to Madagascar and I have just been again, this time to go down the Mongoky River, another big river in the S.W. Before rafting we first visited two National Parks in the rain forest area in the east, Perinet and Ranomafana. At Perinet we once more both saw and heard the Indri, the largest of the surviving lemur, whose haunting song is of such breath taking beauty. In Ranomafana we saw three other lemur species and also a fossa, a small genet like carnivore, also many beautiful orchids and we were discovered by many not so beautiful but very hungry leeches. We followed this by a three day hike on the Isslo Massif, a spectacular area of deep narrow gorges, limestone pinnacles and amazing indigenous vegetation, not to mention gloriously elegant white sifaka lemurs.

The Mongoky itself was wide, shallow and majestic, moving through a landscape of low mountains and dry forest. Several of our camp sites were visited by curious groups of lemurs who viewed us from aloft. The most enchanting were the ring tailed lemur with their huge fluffy tails. We finished up in an area called the Spiny Forest where there is the most bewildering array of vegetation wholly unique to Madagascar. To call it spiny is an understatement, but more amazing are the shapes into which these weird plants grow appearing to defy all norms of plant behavior. No less strange are some of the small creatures that live there, chameleons and such.

So, as for the future I hope you will wish our museum enterprise well. I will most happily remain on the Lewa Board of Directors and hope to spend several months each year here and in particular I hope to come back and help host the winners of each year's "Bowling for Rhinos" as they are always people I should hate to miss meeting. As from the end of the year I can be contacted at either the Lewa Wildlife Conservancy address or at P.O.B. 157, Vaalwater, Transvaal, 0530 South Africa.

*(Editor's Note: As of this writing, Anna is scheduled to be in attendance at the 1996 AAZK National Conference in Detroit, MI. We hope many of you will have the opportunity to meet this remarkable woman during the conference week and hear her update on the progress at the Sanctuary.)*



# Captive Breeding For Macaw Conservation In Costa Rica

By G. Suzanne Chacon, Avian Propagation Specialist,  
*Amigos de las Aves, Costa Rica*

Amigos de las Aves is a Costa Rican, non-profit society dedicated to the conservation of the two endangered species of macaws endemic to Costa Rica. Founded by Margot and Richard Frisus in 1992, the facility concentrates on breeding the Great Green macaw (*Ara ambigua*) and the Scarlet macaw (*Ara macao*) for reintroduction into their native habitat. The Great Green or Buffon's macaw was listed on Appendix 1 of CITES in 1991. Due to the rare sightings population numbers are hard to estimate, the most recent study indicates it may be as low as 30 breeding pair (Rivera 1996). Without implementing a conservation plan it is likely it will soon be extirpated from Costa Rica (Bjork & Powell 1995).

The wild population has not increased due to continued deterioration in habitat, poaching and their naturally slow reproduction rate. Their movements are migratory and they require large tracts of broad-leaved forest. Unlike many other macaws, the captive populations of Buffon's is very small. Numbers need to be increased to maintain a viable and self-sustaining population. Breeding success has been scattered and inconsistent in the United States and has been non-existent in Costa Rica. Unfortunately, in the United States, hybridizing has taken place with the Military macaw (*Scientific name*).

The Scarlet macaws were once abundant throughout the Caribbean and Pacific lowlands (Stiles & Skutch 1989); they are now reduced to the Pacific slope, in three areas with between 400-600 total individuals (Abramson *et al.* 1995). Although bred in captivity in Costa Rica, the number of birds currently reproducing in individual collections is not likely to contain the genetic diversity for a wild flock to be established. In the United States hybridization between the three probable subspecies of Scarlets has occurred; in addition generations of captive bred birds are more likely to produce offspring which cannot adapt to native food sources.

It is a dream of Margot and Richard Frisus to release flocks of Scarlet macaws and Great Green macaws hatched at their breeding facility into protected areas. That dream has quickly become an important conservation effort. After living in various places around the world, the couple settled in Costa Rica in 1980. Their 8.5 acre (3.4 hectare) estate, "Flor de Mayo", in Rio Segundo de Alajuela was once the summer home of the famed 19th century botanist Sir Charles Lankester. Entrusted by the government of Costa Rica, many of their macaws were acquired from owners with guilty consciences who were unable to adequately care for their birds. In 1986 the Frisuses were credited as the first aviculturist to breed macaws in Costa Rica. Since then, they have reared 70 Scarlet macaws and Blue and Gold macaws. To add genetic diversity to the breeding stock, chicks are traded for non-related adults. Their avian collection now consists of 76 macaws of various species.

Their facility was expanded in 1994 by a donation which included the use of eight acres of land across the road. In an 24m x 9m (80' x 30') flight cage built on the new property, ten non-breeding Scarlet macaws were introduced as a flock to naturally pair off in the roomy



aviary. After a year, the birds were moved to spacious, newly-built breeding cages. Currently, with help from a donation from Chiquita Bananas, more breeding cages are being built on the property to house seven pair of Buffon's macaws. Another donation was used to build a well from which a mist system for the birds was installed and it is used for irrigation during the dry season. The land hosts an organic vegetable garden which helps to feed the birds. The bulk of the daily diet consists of rice, corn, beans and locally grown fruits and vegetables. Supplements of protein items, imported nuts and commercially processed macaw food are offered when available.



**The author tending one of the macaw chicks hatched at Amigos de las Aves. This facility concentrates on the breeding of Great Green and Scarlet Macaws for release to the wild. (Photo provided by author)**

Veterinarians Adrienne Allison Otto and Matthew Bond have been health screening the birds to make an initial determination as to the suitability of the birds as breeders for the release program. Their studies indicate the captive flock may be good candidates from which to produce releasable birds (Otto & Bond). Possible "soft release" sites are available but the food sources on the land need to be studied prior to seeking government approval. The biological controversy continues for opponents for and against release but, unlike the release program, the necessity for captive breeding goes unquestioned. Small, isolated wild populations may need genetic diversity to recover and research can be conducted on the captive birds. Captive birds can be used for conservation education and be a focal point for ecotourism within the species' natural range. With regulation, surplus birds produced in captivity could be sold to alleviate pressure on poaching wild birds for the pet trade.

Like the Spix macaw (*Scientific name*), if we wait too long to establish captive populations we may see more animals dwindle away to critical levels. As our world tries to cope with



human population pressure, people like Richard and Margot Frisius at Amigo de las Aves will need to be the caretakers of our shrinking wildlife; in hopes of one day returning it to the wild.

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- Otto, A.A.; Bond, M. (1995) *Screening Captive Macaws and Other Psittacines in Costa Rica: A First Step Towards Possible Reintroduction*. Proceedings of the Association of Avian Veterinarians. 1995. pp. 115-120.

For more information or if you would like to help, write to our courier service at: SJO 465, P. O. Box 25216, Miami, FL 33102-5216; Phone/Fax: (506) 441-2658; E-Mail: richmar@ticonet.co.cr. Special tours are available for Zookeepers



**Pictured above are some of the macaws used in the captive breeding program at Amigos de las Aves. (Photo provided by the author)**



# Chapter

## News Notes

### Great Lakes Regional Council Summer Conference Report

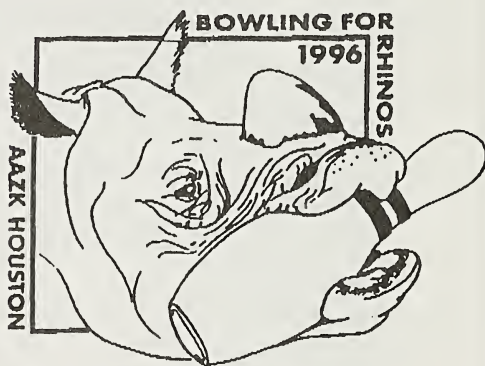
The Great Lakes Regional Council of AAZK's Summer Conference was held 17-18 July. The 17th was spent at the Potawatomi Zoo in South Bend, IN and on the 18th, those attending spent the day at the Washington Park Zoo in Michigan City, IN. The Conference's guest speaker was Peter Gros of Mutual of Omaha's Wild Kingdom. Ten zoos from five states were represented with over 32 delegates in attendance. Topics discussed included the upcoming National AAZK Conference, the suspension of the Regional Coordinator system, the position of Regional Liaisons, the future of the Regional Council and plans for 1997 meetings. Those attending also had behind-the-scenes tours at both facilities, a barbecue dinner at Potawatomi Zoo, and a continental breakfast provided at the Potawatomi Zoo by Washington Park Zoo staff. Many delegates who camped out on the zoo grounds were unfortunately caught in overnight thunderstorms.

Of the former RCs for the region, three of the five were in attendance. Members Dan Powell (Potawatomi) and Jan Weinig (Washington Park), with support from their respective Directors, put this conference together. Thanks go out to all departments at the facilities involved for their support and help with this highly successful and memorable Regional Council meeting.

—submitted by Wayne J. Hazlett,  
Assistant L.I.N.K Coordinator

### Greater Houston Chapter of AAZK

The GHCAAZK has their 1996 Bowling for Rhinos T-shirts for sale. They are grey shirts with a red, white and black design of a rhino holding a bowling pin in its mouth (see inset). The shirt was designed by Ric Urban. We have childrens' mediums (10-12), adult L, XL and XXL. We also have adult Large tank tops. All shirts are \$12.00.



Anyone interested in purchasing a shirt, or if you have any questions, contact: Connie Dieringer, Houston Zoological Gardens, 1513 N. MacGregor, Houston, TX 77030. Phone - (713) 520-3212 (w); (713) 292-1271 (h).

--Connie Dieringer, GHCAAZK

### EFBC/Feline Conservation CenterChapter of AAZK

Chapter fundraisers have included bake sales at EFBC special events, and sale of a great leopard cub photo in the Gift Shop. We recently voted to purchase a 'people mister' system to combat the 110° F weather out here (the cats' cages all have misters, but the visitors/volunteers need one, too!).

Current officers are:

President.....Karla Losey  
Vice President.....Nancy Vandermey  
Treasurer.....Renee Richardson  
Secretary.....Susan Porter  
Liaison.....Kay Munsey  
Alternate.....Ellen Fiol

—Nancy Vandermey, *Vice Pres.*

### **South Florida AAZK**

Current officers for the South Florida Chapter are:

President.....Michael Hernandez  
Vice President.....Kathy Hitchcock  
Secretary.....Pam Monseur  
Treasurer.....Susan Kong  
Chapter Liaison.....Patty Leon-Singer

Our Bowling for Rhinos was a success! Ninety-nine bowlers and plenty of volunteers participated on 8 June to raise over \$3000.00 for the Lewa Wildlife Conservancy and Ujung Kulon National Park.

Our next fundraiser was the Annual Breakfast with the Keepers which brought in over \$1000.00. Both children and adults enjoyed the event and had a wonderful time getting up close and learning about some interesting animals and their keepers.

We have a rummage sale planned for later this year and then our 16th Annual Keeper Banquet in December. We are also happy to be able to provide some financial aid to some of our keepers who will be attending the National Conference in Detroit.

—Pam Monseur, *Secretary*

### **Greater Cleveland AAZK Chapter**

The Greater Cleveland Chapter elected four new officers for 1996. They are:

President.....Meghan Kelley  
Vice President.....Shane Good  
Secretary.....Kym Parr  
Treasurer.....Chriss Kmiecik

So far in 1996 we have recruited 16 new members into our Chapter. Seven of these new members are new national members and the rest were national members who were not active in our local Chapter.

One of the most exciting projects involved the possible development of a sister zoo relationship in Merida, Venezuela. This is in conjunction with the Cleveland Metroparks Zoo's partnership with Cleveland State University and the University of the Andes, Venezuela. Together, these organizations are development conservation and research projects in one of the world's most endangered ecosystems, the tropical dry forest.

Our first annual Spaghetti Dinner was held in the Cleveland zoo's Primate, Cat and Aquatic building and was a huge success. We raised over \$600.00 that we put towards Bowling for Rhinos. This year's Bowling for Rhinos was another great success as we raised a total of \$5000.00.

In addition to Bowling for Rhinos, our chapter has financially supported three organizations that participated in a lecture series at the Cleveland Metroparks Zoo. Speakers included Andy Lodge of the Ngare Sergoi Support Group, David Mech of the International Wolf Center, and Roger Mustalish of the Amazon Center for



## Environmental Education and Research.

The Cleveland Zoological Society has been kind enough to sponsor the money needed for a local artist to develop a new logo for our AAZK chapter. This should be coming soon. Other Chapter activities include our sponsorship of educational exhibits on "zoo safety" at Safety Day at the Zoo, and an educational exhibit about endangered species for the upcoming Boo at the Zoo Halloween celebration.

We have a lot of new ideas and a lot of new projects in the beginning stages, so look for some exciting news from the Greater Cleveland AAZK!

—Shane Good, Vice Pres.

### Minnesota Zoo AAZK Chapter

The Minnesota Zoo Chapter of AAZK held its annual Bowling for Rhinos event on 7 June. Over \$6,000.00 was raised due to the efforts of many zoo staff, family and friends who participated. The top money raiser, also one of the key organizers of the event, was our own Vice President, Christine McKnight, who brought in over \$2,000.00 by herself. Bowlers took home door prizes donated by local businesses that totaled more than \$2,000.00 in value, competed in "Guess the number of rhinos in the fishbowl" contest, consumed rhino-shaped cookies and jello cutouts, received a custom-designed BFR T-shirt, and even participated in karaoke afterwards. Our Chapter thanks all the local businesses that helped support the event, and all the people who participated so enthusiastically and made it so successful.

Another of our Chapter fundraisers resulted in over \$600.00 being sent to the Philadelphia Zoo. In conjunction with a local Barnes and Noble Bookstore, we were allowed to set up a table in the store and using animals and props draw attention to our organization and its mission. As a result, we received a percentage of the profits from one register for those hours we were there. We are already planning several more of these "bookfairs" for other projects we hope to contribute towards.

Finally, we were fortunate to have as a guest speaker in June, Sally Walker from the Zoo Outreach Organisation/CBSG India. Her report on the history of zoos and conservation in India was enjoyed by all.

—Tim Hill, Chapter Liaison

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### *AZA Conference Schedule*

AZA Eastern Regional Conference, March 19-22, 1997 - Memphis, TN. For further information, contact Carol Cratin, Memphis Zoo, 2000 Galloway Ave., Memphis, TN 38112 (901) 725-3450.

AZA Western Regional Conference, April 9-12, 1997 - Phoenix, AZ. For further information, contact Bruce Bohmke, The Phoenix Zoo, 455 North Calvin Parkway, Phoenix, AZ 85008 (602) 273-1341.

AZA Central Regional Conference, May 15-18, 1997 - Cleveland, OH. For further information contact Jim English, Cleveland Metroparks Zoo, 3900 Brookside Park Dr., Cleveland, OH 44109 (219) 661-6500.

# AAZK NATIONAL CONFERENCE

Detroit, Michigan

October 6-10, 1996

The Conference Schedule is brimming with spectacular speakers, papers and workshops. You'll find that not only are the scheduled activities informative, but *fun* and *exciting* too. So don't miss out, be here in October.

Here are a few reminders & hints for those lucky enough to attend:

- Airport shuttles to the Crowne Plaza Pontchartrain Hotel leave Detroit Metropolitan Airport every hour on the hour starting at 7:00 A.M., with the last shuttle leaving at Midnight. The fares are \$13.00 one-way and \$24.00 round-trip. Ticket counters of the Commuter Transportation Co. are located in all baggage claim areas. For further information call 1-800-488-7433.
- Michigan weather in October is never certain. It might be hot, cool, wet, or dry. Please bring a jacket and raingear for outdoor activities, such as the river cruise.
- If you plan on visiting Canada, don't forget your birth certificate or passport in case of Customs complications. Windsor, Canada has new casinos and the Metro Toronto Zoo is only about four hours away.
- Please don't forget to bring your zoo patches for the Silent Auction or Patch Swap.
- And don't forget the auctions. You'll receive a nifty conference backpack to take all of your new auction treasures and other loot home.
- Poster presentations are still being accepted. Contact Linda Wachsberg, (810) 398-0903 ext. 3183.
- Kudos to all the Chapters that have already helped with sponsorships!
- Hotel Registration Forms may be found in the April, June and August issues of the *AKF*. Please note that conference rates are only guaranteed until Sept. 20, 1996. Reservations made after this date are made on a space available basis *only*. For reservations dial 1-313-965-0200 or 1-800-2-CROWNE.

**We're Looking Forward to Seeing You in October !**





# 1996 AAZK NATIONAL CONFERENCE

## SCHEDULE OF EVENTS

### Saturday, October 5

**Pre-Conference Trip** - A Michigan Loop to the *Binder Park Zoo* & the *John Ball Park Zoo* from 8:00 a.m. to 10:00 p.m.

### Sunday, October 6

**State of the Association Meeting**

**Committee Meetings**

**Icebreaker** - Held at the "Top of the Pontch" Crowne Plaza Pontchartrain Hotel.

### Monday, October 7

**Welcome Breakfast**

**Speaker Session:**

"Orangutan Conservation", Dr. Birute M.F. Galdikas (Orangutan Foundation International)

"Strategies & Action for Field Conservation: Coalition for Reefs & Rainforests", Norman Gershenz (Center for Ecosystem Survival)

"The Fund Raising Success Story of Bowling for Rhinos", Patty Pearthree (National BFR Coordinator)

"Rhino Conservation", Anna Merz & Andy Lodge (Ngare Sergoi Support Group)

"Social Relationships in Wild Baboons", Dr. Barbara B. Smuts (University of Michigan)

**Concurrent Presentation Sessions**

"International Bear Parts Trade", Linda Wachsberg (Detroit Zoological Institute)

"Assisting Field Conservation on a Shoestring Budget: The Metamorphosis of FRAWG", Fred Swegel (Minnesota Zoo) (Friends of Rare Amphibians of the Western Ghats)

Richard Block (Vice President, Scientific & Program Development) (Indianapolis Zoo)

"The Elephant 'Hump': a Special Method to Hold and Use Water", Dr. Jeheskel Shoshani (Elephant Research Foundation and Wayne State University)

"Detection & Treatment of a Possible New Disease Syndrome in a Captive Black Rhino", Christine M. Bobko (Denver Zoological Park)

"The Water Bucket or Speaking of Tools, Don't Look at Me, I Didn't Take It", Leslie Keys (Detroit Zoological Institute)

"A Successful Reintroduction of an Initially Rejected *Pan troglodytes* Newborn to Its Natural Mother", LeeAnn Anderson (Honolulu Zoo)

"The Care & Procedures Involved in Mending a Broken Leg of a Two and a Half Year Old Giraffe - A Keeper's Perspective", William Pentler (Albuquerque Biological Park)

Earthwatch - Keeper Involvement Session

"Hippopotamus Underwater Behavior & Communication", Stephen Krueger & W. Shelb (Toledo Zoo)

"Hippopotamus Training, Implications for Veterinary Care", Stephen Krueger (Toledo Zoo)

"Mustached Tamarins on the Loose", Linda Pastorello (The Zoo, Gulf Breeze)

"Great Lakes Zebra Mussel Invasion", Jerrie Nichols (University of Michigan/USFWS)

"Contraception", Dr. Cheri Asa and Ingrid Porton (St. Louis Zoological Park)

"Elephants Never Forget' ...A New Interpretation & Other Aspects of Elephant Natural History and Conservation", Dr. Jeheskel (Hezy) Shoshani (Elephant Research Foundation)

### Tuesday, October 8

**Presentation Sessions**

Environmental Enrichment Session, Led by Dianna Frisch (Columbus Zoological Gardens)

"Inhlovudawana' or 'Little Elephant': Managing Warthogs Through Operant Conditioning", Jeffrey Phillips & V. Cloniger (North Carolina Zoo)

"Carnivore Enrichment", Dr. Anna Duncan (Detroit Zoological Institute)

"From Rags to 'EN' Riches", Lucy Segerson, (North Carolina Zoo)

"Buffalo Zoo's Predator Exhibit", David E. Brigham (Buffalo Zoo)

Animal Loss & Grief Session, Sally O. Walshaw, M.A., D.V.M. (Michigan State University)

Tarantula Spiders, Michael Reed (Detroit Zoological Institute)

**Lunch at the Belle Isle Zoo and Aquarium; Detroit River Riverboat Cruise; Awards Dessert and Silent Auction back at the Hotel.**

### Wednesday, October 9

**Guest Speaker** - "Great Apes", Dr. Birute M. F. Galdikas (Orangutan Foundation International)

**Detroit Zoo - Zoo Day - Includes BBQ Lunch**

#### Workshops/Demos

"Zoo Ethics", Dr. Ron Kagan, Director (2 Workshops - Sign up at Cobo)

Ungulate Hoof Trimming, Dr. Ross Brown & Dr. Dalen Agnew, Veterinarians (2 Workshops ; limited to 30 people per session. Sign-up information below)\*

Penguin Husbandry, Jessica Joswiak, Keeper

Flamingo Husbandry, Amiee Cochell & Tracy Ortiz, Keepers

Hummingbird/Butterfly Husbandry, Tom Brown, Keeper

Giraffe Squeeze Demo, Beth Johnson and Elephant Staff

Elephant Nail Patch Demo, David Nestle and Elephant Staff

Reptile/Amphibian Husbandry, Leslie Gaines and Reptile Staff

Marine Mammal Feeding

Bear Feeding

#### Behind-the-Scenes Tours

Great Apes Exhibit (four acres), Penguin Exhibit, Elephant/Rhino Exhibit, Tiger/Mandrill Exhibit, and Giraffe Exhibit.

#### Evening Workshops

Bat Conservation, Bob Benson (Bat Conservation International)

"Record Keeping with Word Processors, Spreadsheets and Databases", David Merner (San Diego WAP)

Macaw Egg Incubation, G. Suzanne Chacon (Aves de las Aves)

Australasian Rap Session

REC Diving "Wet" Workshop (Limited to 30 people. Sign-up information below)\*

\*The Ungulate Hoof Trimming Sessions are hands-on workshops, using previously owned hooves and led by professional Hoof Trimming Veterinarians. The two workshops are limited to 30 people each. The REC Diving "Wet" Workshop is a hand-on/equipment-on/in the pool/off-site Scuba Diving experience led by professional Scuba Diving Instructors. This workshop is limited to 30 healthy people. Don't forget to bring your swimsuit and towel.

\*In order to sign up for these workshops, you must register for the Conference. don't miss out, register early!! If you are already registered, you can sign up by calling Pat Granberry (810) 398-0903 ext. 3183.

### Thursday, October 10

#### Speaker Session

"The AZA Conservation Program - Opportunities to Make a Difference", Dr. Robert Weise (AZA)

"The Large Felid Pet Trade", Gary Tiscornia (Michigan Humane Society)

"Primate Pet Trade", Scott Carter (Detroit Zoological Institute)

"Beating Up Zoo Keepers: Effective Management or Just Plain Fun?", Tony Vecchio, Director (Roger Williams Park Zoo)

"Red Uakari Research & the Tapicha Project in Peru", Suzi Leonard (Detroit/Dallas Zoos WRE Program)

#### Concurrent Presentation Sessions

"Biodiversity in Zoos: or Not All Animals Have Hair", Linda Wachsberg (Detroit Zoological Institute)

"Safety First & Always...at the Jackson Zoo", Tom B. Brown (Jackson Zoo)

Scuba Diving in the Galapagos Islands (REC Diving)

Exotics in Animal Control, Terry DeRosa (Detroit Zoological Institute)

"Creation of an Age-Diversified Gorilla Group Through Alternative Means", Susan White (Columbus Zoo)

"Water Conservation: What Keepers Can Do", Jennifer Brown & Pat Fabian-Chavez (Albuquerque Biological Park)

#### Annual Business Meeting

1999 National Conference Bids. Get those Bids in to Ed Hansen!

1998 National Conference Preview Presentation - Indianapolis Zoo AAZK Chapter

1997 National Conference Preview Presentation - Houston Zoo AAZK Chapter Yah-hoo!

**Live Auction & Banquet** - Held at Cobo's Riverfront Ballroom

Friday-Sunday, October 11-13 - Post-Conference Trip - An Ohio Loop to *The Wilds*, *Cleveland Metroparks Zoo*, *Akron Zoo* & *Sea World of Ohio*.



1996 AAZK National Conference  
Detroit, Michigan  
October 6-10, 1996

**CONFERENCE REGISTRATION FORM**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State/Province: \_\_\_\_\_

Zip: \_\_\_\_\_ Phone/Fax: (    ) \_\_\_\_\_

Zoo Affiliation: \_\_\_\_\_ Title: \_\_\_\_\_

Primary fields of interest: \_\_\_\_\_

AAZK Chapter: \_\_\_\_\_ AAZK Membership Status: \_\_\_\_\_

Number of AAZK Conferences you have attended: \_\_\_\_\_

Presenting a Paper, Poster or Workshop?    \_\_\_\_\_ Yes    \_\_\_\_\_ No

Title: \_\_\_\_\_

AAZK Committee member?	Yes _____	No _____
Bringing an Auction Item?	Yes _____	No _____
Interested in a T-shirt?	Large _____	X-Large _____
Vegetarian?	Yes _____	No _____ Type: _____

Arrival Date and Time: \_\_\_\_\_

**CONFERENCE FEES**

Full Conference Rates:

AAZK Member or Spouse	\$110.00	_____
Non-Member	\$120.00	_____
Late Fee*	\$ 10.00	_____

Daily Conference Rates:

Icebreaker	\$10.00	_____	Wednesday	\$30.00	_____
Monday	\$25.00	_____	Thursday	\$20.00	_____
Tuesday	\$30.00	_____	Banquet	\$20.00	_____
Late Fee*				\$ 3.00	_____

\*Late Fee charged after 9-1-96    Total Amount Due: \$ \_\_\_\_\_

Fee does not include cost of Conference Proceedings. Fee included \$20.00 contribution to AAZK National. Make checks payable (U. S. Funds) to: Detroit Chapter of AAZK. Return form and all fees to: Pat Granberry & Beth Johnson, Detroit Chapter of AAZK, 8450 West 10 Mile Road, Royal Oak, MI 48068-0039.

# Legislative Update

Compiled by Georgann Johnston  
Legislative Advisor  
Sacramento, CA



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## Zimbabwe's National Parks to Benefit from Expanded Funding

In July 1996, Zimbabwe's national parks will benefit from a new policy designed to return all of the money earned by the parks directly to the Department of National Parks and Wildlife Management. This new program, called the "National Parks Conservation Fund", changes the previous governmental policy of turning all of the money generated by the parks over to the central treasury of the country.

The parks of Zimbabwe, which cover about 10% of the land, are a major tourist attraction. In 1995 more than 1.4 million tourists visited the country, spending over \$136 million (all figures in U.S. dollars). The condition of the national parks has been declining over the past few years, evidenced by poor road maintenance, problems with water delivery systems, and defects in other infrastructures. The parks bring in approximately \$2.3 million each year from entrance fees, tourist accommodations, sale of animals and hunting fees. This can be compared to an overall operating budget of \$5.8 million and a projected need for a budget of \$9.8 million to bring the parks up to standards.

One positive note which accompanied the announcement of the new funding plan was that the Parks Department was able to decrease the amount of money spent on anti-poaching measures. Rhinos, elephants, lions and other wildlife, previously the target of illegal poachers, are less likely to be the subject of theft over the past few years.

*Source: African Wildlife Update June 1996 vol. 5, No. 3, published by the African Wildlife News Service*

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## Eastern Box Turtle Gains Protection from USFWS Ruling

The eastern box turtle (*Terepene carolina*) was the subject of a ruling by the U.S. Fish and Wildlife Service which prohibits the state of Louisiana from exporting box turtles during 1996. The state had request a permit to export approximately 10,000 turtles, most of whom would have been shipped to Europe for the pet trade. This species is listed under Appendix II of CITES and trade is allowed only under permit and if the government determines it is not detrimental to the species as a whole. The two primary reasons cited by the USFWS for denying the export permit involved the continuing loss of natural habitat for the turtles and the fact that they have become very popular subjects in the pet trade



"Approving such a high export quota from just one state would greatly undermine the U.S. commitment to protect box turtles here at home", stated Andrea Gaski, Director of TRAFFIC, the wildlife trade monitoring unit of the World Wildlife Fund which pushed for denial of Louisiana's permit application. Louisiana has filed an appeal of the USFWS's decision and is also asking that the species be completely removed from CITES protection.

*Source: Focus, July/August 1996, vol. 18, no. 4, published by the World Wildlife Fund*

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### **Saltwater Crocodile Status Downgraded from Endangered to Threatened**

The saltwater crocodile (*Crocodylus porosus*) population of Australia has been reclassified from endangered to threatened under the U.S. Endangered Species Act. This species had been listed as endangered throughout most of its range since 1979. Alternatively known as the estuarine crocodile, this species ranges from southwest India, throughout Southeast Asia, through the Pacific Islands and south to the northern coast of Australia. It is the largest crocodilian species, reaching an average length of 6.1 meters (over 20 feet).

The saltwater crocodile is found in estuaries, mangrove swamps and tidal reaches of rivers. Its endangered status was attributed to serious loss of habitat throughout most of its range and because of extensive poaching for its hide. Australian law has allowed for trade in captive-bred members of the species and that country recently petitioned the USFWS for a change in status reclassifying Australian specimens. Due to captive breeding and the collecting of eggs or hatchlings from the wild, the overall population of the species in Australia has increased significantly. The USFWS, in reclassifying the crocodile's status, found that Australia's management of wild and captive populations and data from population surveys justified a downgrading of the animal's status.

The change in status will not be effective until July 1997. Further information about the USFWS decision may be obtained from Dr. Charles W. Dane, Chief, Office of Scientific Authority, USFWS, Washington, DC, (703) 358-1708.

*Source: Federal Register, 24 June 1996, vol. 61, no. 122*

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### **Copperbelly Water Snake Proposed as New Threatened Species**

The U.S. Fish and Wildlife Service has reopened the public comment period on a proposal to list the copperbelly water snake as a threatened species. Comments will be accepted until 16 September 1996.

This species is found in Michigan, Ohio, Indiana, and Kentucky. It lives in bottomland forests and swamps where there are warm, quiet waters. The species also uses adjacent upland woods and fields for travel between suitable habitat and for winter hibernation. Like many other species, the copperbelly snake is threatened primarily due to the loss and degradation of its habitat. Clearing and draining of wetlands, road construction, surface mining and dams which flood lowland habitats

have reduced the amount of available habitat. In Indiana, for example, over 80% of the state's wetlands have been modified destroyed.

Further information and/or comments regarding the listing of the species may be directed to Division of Endangered Species, USFWS, Bishop Henry Whipple Federal Building, 1 Federal Dr., Ft. Snelling, Minnesota 55111-4056, (612) 725-3536.)

*Source: USFWS Press Release 16 July 1996*

### **Logging Threatenes Ecuadoran Species Such as Jaguar and Howler Monkey**

This past spring, the government of Ecuador granted a private company the right to pursue logging in the remaining 1% of the country's primary coastal tropical rainforest. An area of approximately 180,000 acres, the Mache-Chindul Park contains many rare plant species and is also the home to the mantled howler monkey and the endangered jaguar.

This particular area of Ecuador has been the subject of logging for more than 30 years. As in other rainforest environments, the construction of logging roads has been followed closely by human colonists moving into the area and developing it further. These new populations then cut down and burn the remaining trees to create farm and pasture land. It has been estimated that 97% of all coastal forests of Ecuador have been destroyed in this fashion.

The area which is to be subjected to new logging is also home to the Bilsa Biological Station, a conservation project involving more than 60 local native tree species. Bilsa has been attempting to grow saplings and then use them to reforest the logged areas of the Mache-Chindul region. Bilsa now faces the problem of having literally no land to "reforest", since property rights to the vast majority of the region have been granted to two well-financed logging companies.

*Source: GreenDisk; Paperless Environmental Journal, April/May 1996*

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### **Australia Issues State of the Environment Report Card**

An independent nation-wide assessment of the status of Australia's environment has just been released by the Australian Department of the Environment, Sport and Territories. More than 200 scientists, academicians and environmental experts provided information about land, water, air human settlements, plants and animals. The purpose of the report is to provide Australian citizens with timely and accessible information about the condition of and prospects for the country's environment.

Entitled "Australia: State of the Environment 1996", the publication is divided into seven major categories including atmosphere, biodiversity, land resources, and natural and cultural heritage. The biodiversity section contains a vast amount of information on the loss of biological diversity; labeled as the most serious environmental problem currently faced by the country. The report's authors point out that while Australia is home to more than one million species, less than 15



percent have been identified and described. Additionally, of those recognized, 9% of birds, 23% of marsupials, 7% of reptiles, 16% of amphibians and 9% of fresh-water fish have gone extinct or are seriously endangered.

The report addresses a variety of problems which have resulted in the loss of biodiversity. For example, the introduction of 18 exotic mammals which have established feral populations are implicated in the decline, if not the extinction, of a number of species. The red-tailed black cockatoo is just one illustration, since its population has been decimated by feral cats climbing into tree hollows and preying on nestlings.

The report also points out that no broad Commonwealth, State or Territory legislation for the conservation of biodiversity currently exists and that no financial incentives are in place to encourage conservation of the country's natural resources. In sum, the report is an in depth analysis of the state of the environment for the Australian continent. A copy of a summary of the report can be obtained by visiting the Web site of the Minister of the Environment located at [http://www.erin.gov.au/portfolio/library/minister\\_env/bg27jun.html](http://www.erin.gov.au/portfolio/library/minister_env/bg27jun.html)

*Source: Australian Department of the Environment, Sport and Territories Media Release 27 June 1996*

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# **Conditioning Unrestrained Black Rhinoceroses** (*Diceros bicornus*) **For Venipuncture**

*By Dana Nicholson, Pachyderm Keeper  
Milwaukee County Zoological Gardens*

## **Introduction**

There are many benefits to having voluntary cooperation of animals while attempting husbandry and medical procedures. Behavioral management using positive reinforcement is proving to be a useful tool in managing zoo animal health care needs. Traditionally stressful events are being reduced with the increase and reliability of the desired trained behaviors. Research projects and routine procedures proceed in a more orderly fashion (Bloomsmith, 1992; Priest, 1990). The consistency in which samples are collected can be completed in a shorter time compared with the traditional methods (Laule, 1992; Mellen, 1991).

Acclimating and desensitizing a rhinoceros to the various procedures required for venipuncture can lessen the need to modify the institution's physical structure. Unless your institution has a restraint chute incorporated into its caging, some modifications may be necessary to ensure the safety of personnel and animals. You can start with limited facilities and the patience of a few keepers and senior animal staff.

## **Methods**

In order to decide on the best approach for the venipuncture, several variables should be considered. You should try to use your institution's physical structure to your advantage.

The tractability of the rhinoceros is the first major concern. If the animal is not comfortable with the close contact from keepers, your first goal will be to habituate it with several zoo keepers. Most likely, food and to a lesser extent, tactile stimulation, can be used as a primary reinforcer.

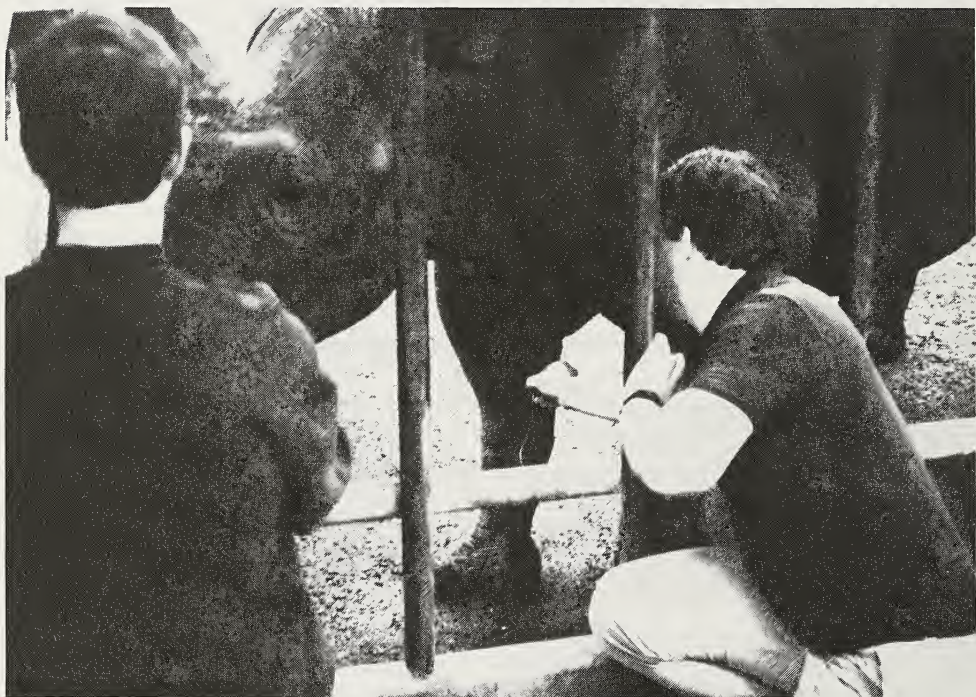
Start out with 10-minute training sessions with the keeper putting an emphasis on developing a relaxed body posture in the animal. After a short period of time, you should begin to notice considerable cooperation from the rhinoceros. The development of a consistent training program is important in gaining the trust of the animal and will assist in future husbandry and medical applications.

After you have the ability to maneuver the rhinoceros by using positive



reinforcement, the best structural location in your facility will have to be determined in order to start work on the venipuncture technique.

A barrier with either vertical or horizontal bars may be used. The animal can be maneuvered parallel to the bars and stopped when the opposite medial cephalic or radial forelimb vein is exposed (Figure 1). If your particular animal is manageable, one keeper will reinforce the animal while the other person can start the desensitizing process for needle insertion. A butterfly catheter works the best, since it allows for some movement of the animal.



**Veterinarian Andrew Teare is shown inserting a butterfly catheter into the right cephalic vein of our male while parallel to the bars. The author is rewarding the rhino for being relaxed and remaining stationary.**  
*(Photo by Joan Mauer)*

The systematic desensitization for a venipuncture is straight forward. After the trainer has gotten to the point where the animal allows access to the medical forelimb area, alcohol swabs can be introduced. You can then start several exercises of occluding and applying pressure to the vein. Using your fingernail or a key are good ways to simulate a needle prick. When you feel the animal is ready for a venipuncture, try a catheter with a 21 gauge needle. This size seems to be tolerated the best and allows sufficient quantities of blood to be taken.

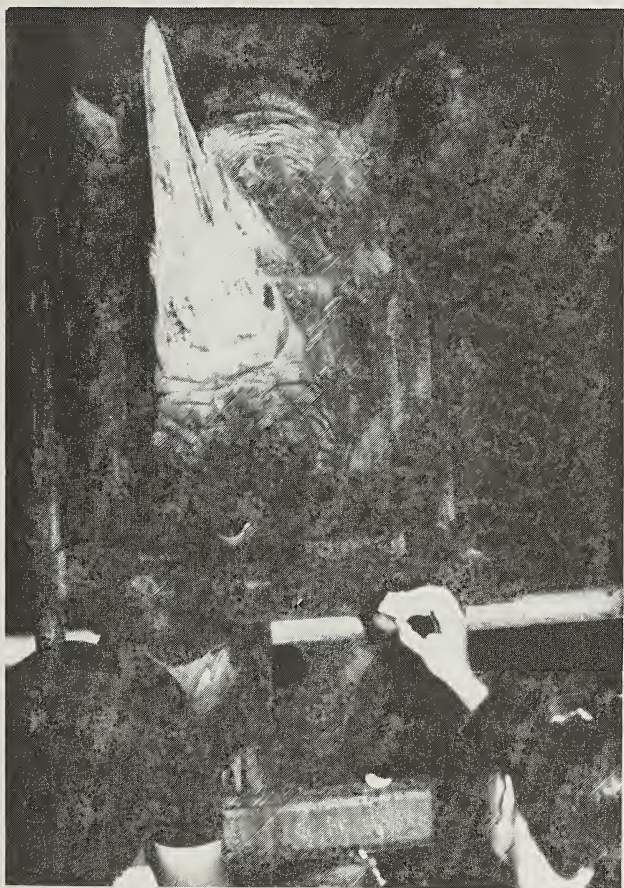
If your animal has had a previous negative history to aversive situations, the



desensitization process is more critical in neutralizing those experiences. Only when the rhinoceros is totally relaxed with the initial steps should the trainer proceed.

There are several important points to remember. The first several times you stick the animal, be prepared to heavily reinforce the behavior. In some cases expect regression. You may have to go back to a point in the training where the rhinoceros is comfortable, and then slowly proceed with the desired behaviors. Finally, once the procedure becomes routine, the trainer should practice the venipuncture behavior periodically without actually inserting the needle.

If you have an animal that tends to be nervous, minor modifications can be done to construct a head chute with a minimal amount of welding. Once the rhinoceros becomes familiar with the head chute, blood collection is easily obtained from either front leg (Figure 2). If the animal becomes upset, it can easily back out of the head chute. This method will provide complete safety to the person attempting the venipuncture.



**The author is in the process of bleeding our female while she is positioned in the head chute. Keeper Claire Hubmann is rewarding the rhino for maintaining her position. (Photo by Joan Maurer)**

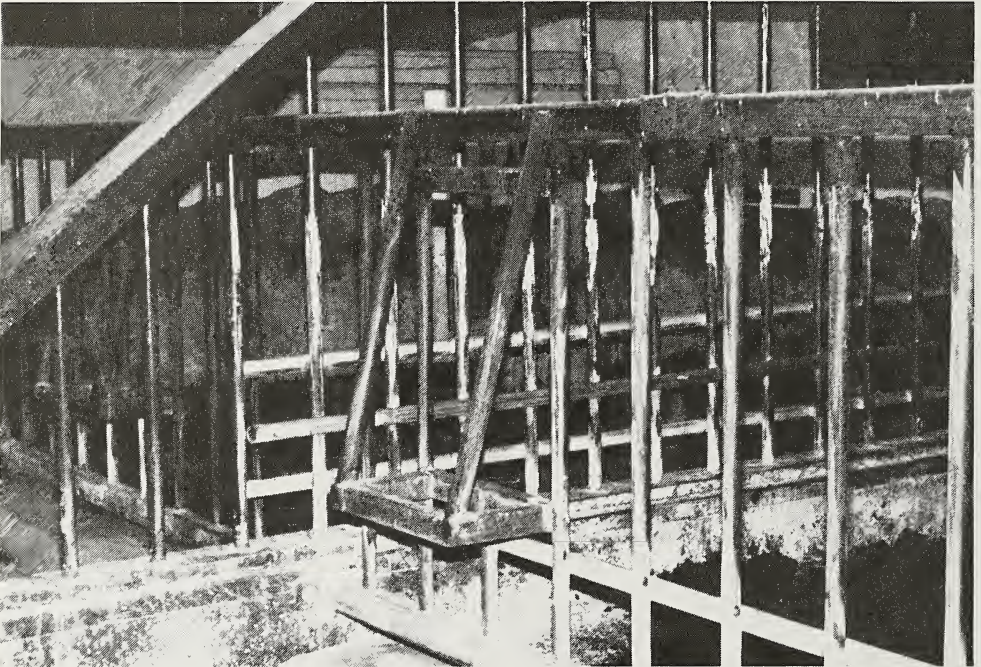
### **Design Considerations**

In finding the best location for head chute placement, it is best to have the animal in an elevated position in relation to the keeper. In front of a dry moat



or elevated display stall is ideal. This provides good access to the forelimb veins while the animal has its head through the chute. When the rhinoceros is at the same level as the person, venipuncture has to be done from either side and in more of a crouched position.

The design is simple and consists of front and side bars (Figure 3). This allows work to be performed directly underneath the head of the rhinoceros. The head chute gives the animal a defined area and allows for little up and down or side to side movement of the head.



**Side view showing simplistic design of the head chute.** (*Photo by Joan Maurer*)

The trainer will have the animal enter the head chute, then the person doing the blood draw can move into position from either side while remaining close to the barred wall.

The space where the rhinoceros puts its head through will have one or two removable bars (Figure 4). This will allow the head chute to become an integral part of the structure, taking up very little actual space and not visually hindering the exhibition of the animal.

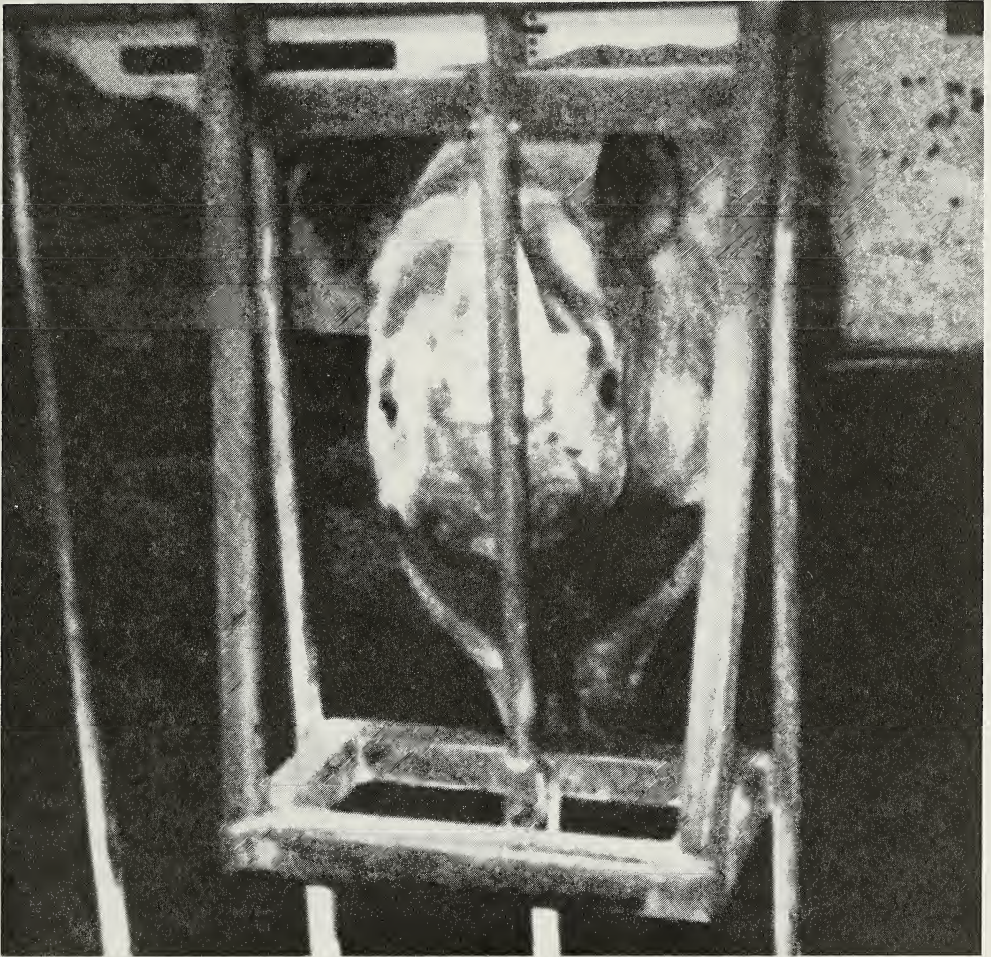
## **Results**

The time span involved from our program's inception to the point of reliably obtaining blood samples varied between animals. Our adult and juvenile males



required about three months of consistent training and the adult female required almost five months, due to her nervous nature.

The length of the blood collection process is dependent on the amount required. We draw directly into the various types of blood collection tubes. Generally, the time span from getting the animal into the head chute to removing the catheter is less than five minutes. We try to work the animals prior to starting other duties, since there tends to be fewer disruptions and the noise level is at a minimum.



**Front view of the head chute with the removable bar in place.** (Photo by Dana Nicholson)

At the present time, we are collecting monthly blood samples to monitor their blood counts and serum chemistries. Serum is also being evaluated for Vitamin E levels in conjunction with supplementation and titer data regarding leptospirosis. We were able to confirm from blood sampling that our female was pregnant with her second offspring using serum progesterone measurements. Multiple blood samples were collected three weeks before the



birth until two weeks after parturition. The serum will eventually be assayed to determine the pre and post parturition levels of progesterone. We have been successful at integrating the six-month-old female calf into the venipuncture routine.

## **Comments**

With increased sampling of rhinoceroses, a broader database can be compiled by more institutions. Hematology values can be collected on a monthly basis. Along with monitoring blood counts and serum chemistries, basic endocrinology and nutritional studies can be conducted. Research can also be conducted on ovulatory cycles. This will assist artificial reproductive techniques. The data that is collected will also contribute to research being done on health-related diseases.

During the early winter months of 1994, our adult male rhinoceros developed generalized cutaneous eruptions. We had been working on some preliminary conditioning leading towards venipuncture. Desensitizing him to the procedure was accelerated. After a week of working this animal several times a day, a blood draw was attempted using the free standing method. The venipuncture procedure proved to be anticlimactic.

Initial test results indicated a low-normal hematocrit. We tried to monitor his blood values on a weekly basis. Subsequent results showed that the hematocrit levels were decreasing.

After a month of depressed hematocrit values, his anemic condition, along with the vesicular dermatitis, improved. Since that episode, he has remained clinically normal. Monthly blood samples are being obtained to help monitor the health of our black rhinoceroses.

## **Conclusion**

The use of positive reinforcement techniques in a zoological setting is a valuable management tool. Many other training and enrichment programs can be implemented from the simple conditioning techniques used with the venipuncture procedure.

The initial stages of a training program will require time and patience. In some cases, scheduling of keepers or exhibiting of animals may require adjustments. The overall benefit allows for a more reliable and less stressful method to perform a wider variety of husbandry or medical procedures.

These procedures will also have a very profound and positive effect on public perception concerning the required care of these extremely endangered animals.

## Acknowledgments

I would like to thank our Deputy Zoo Director, Bruce Beehler, D.V.M., Andrew Teare, D.V.M., and Pachyderm Supervisor, Dave Sorensen, for their encouragement and support in this project.

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## Information Please

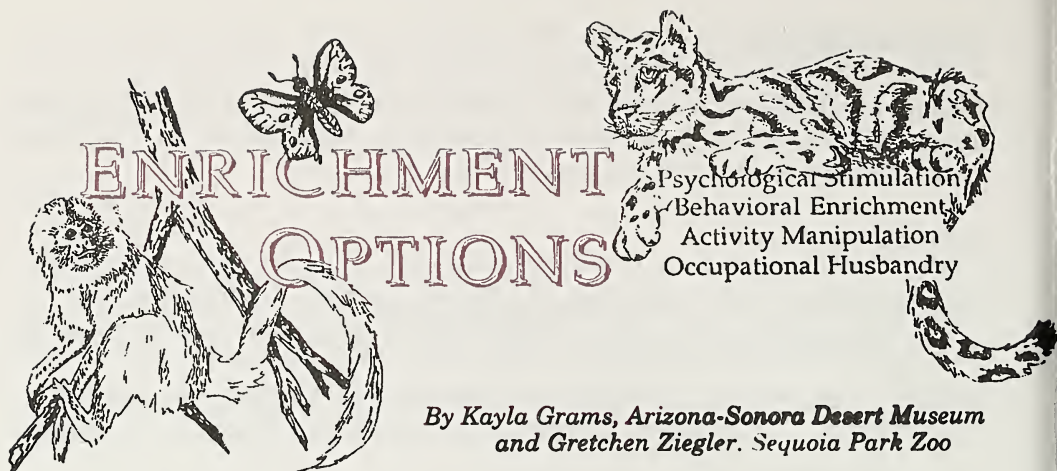
I am investigating alopecia (hair loss) in neonates, in particular Maned Wolf puppies. Three hand-reared litters of maned wolves at Western Plains Zoo, Dubbo, Australia have seen some form of alopecia in the initial weeks of care, despite changes to management. These changes have included the laundry detergents used on their bedding, the cessation of hand antiseptics and quicker reductions in temperatures the puppies are exposed to. Any kind of alopecia experiences would be greatly appreciated. Please send to: Janet Gamble, P.O. Box 831, Dubbo, 2830, New South Wales, Australia; or you can Fax Aust. 068-841-722.

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The Bombay Zoo, Bombay, India is requesting information which would assist them in designing an updated feed collection, preparation and distribution unit for their zoo. There is little information in the literature dealing specifically with setting up such a unit. While any information, articles, design sketches, etc. are welcome, please keep in mind that conditions in India are not like those in the U.S. - specifically the availability of exotic animal food manufacturers, the widespread use of fresh carcass meat as opposed to processed carnivore diet, and the considerable problem of electrical failures in the country which might well preclude long-term storage of perishable items. Any information sent will be shared not only with the Bombay Zoo, but with any other zoos in India seeking information of this type. Please send what you can to: Sally Walker, Zoo Outreach Organisation/CBSG India, Box 1683, Peelamedu, Coimbatore 641 004 INDIA.

Many thanks.





By Kayla Grams, Arizona-Sonora Desert Museum  
and Gretchen Ziegler, Sequoia Park Zoo

**BEARS:** It has been my experience with spectacled bears (*Tremarctos ornatus*) that they do not eat cloth, paper or plastic (with the exception of cellophane tape) which open up a large variety of items they may have. (*Editor's note: While these individual animals may not ingest these items, caution should be used in other situations where behaviors of individuals toward certain items is not yet known.*) As with all animals, the key is to provide something different than their everyday props. Our 2.1 bears are housed in a 12' high, 20' x 20' (3.65m high, 6m x 6m) concrete enclosure. Because they destroy everything very fast, I need easy, cost-efficient devices, and usually not natural (just because natural items often require more staff time and the bears destroy them so fast). I stay very open-minded and throw just about anything into their exhibit that won't hurt them.

We feed the bears' diet whole sometimes, or in very small pieces, or different sizes. One of the most interesting things the bears have experienced was an empty 5' round by 3' deep (1.52m x 1 m) metal stock tank, which they rolled, pushed, jumped on, spun in circles and threw at each other. The tank was removed after the bears started picking it up and throwing it at the visitor's window. Needless to say, it was a big crowd pleaser!

The following are several more ideas which we have tried with our bears:

- 2 x 4s about three feet long, holes drilled and filled with grapes, peanut butter, honey, etc.
- empty plastic barrels with lids
- Two-litre pop bottles filled with treats, sometimes treats with water
- 35-50 gallon heavy plastic trash barrels
- old plastic planters
- old jeans filled with hay and treats
- shoes and boots
- plastic milk crates
- large pieces of PVC stuffed with fruit
- large plastic swimming pools (they take out all the water and destroy the pools.

- small cloth bags with daily diet inside
- phone books with treats inside the pages
- pieces of fruit roll-ups hidden around the exhibit
- 3-inch PVC pipe with caps on the ends, small treats on inside and small holes to disperse treats through slowly (bears will shake, roll, and throw this around until treats are gone).

—Chris Branigan, Keeper  
Folsom Children's Zoo, Lincoln, NE

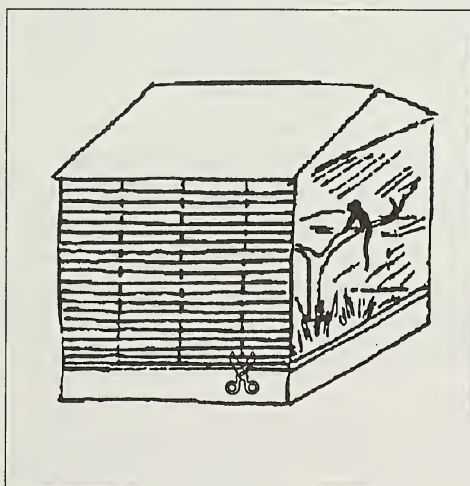
## The Use of Bamboo Shades to Ease Shy Primates Into Public View



This is written mainly with pygmy (*Cebuella pygmaea*) and other marmosets (*Callithrix*) and tamarins (*Saguinus*) in mind, but other shy primates that are newly on display to the public could benefit from this as well. Marmosets and tamarins are often put on display in housing built with one or more glass walls. Bamboo shades provide an attractive means of lessening stimuli from the stream of zoo guests and allow the monkeys an adjustment period.

Purchase outdoor plastic or bamboo window shades from a hardware store. They are hoseable, inexpensive and come in different sizes up to 15' x 8' (4.5m x 2.4m). They are meant to rollup, but cut the cords away with scissors to avoid the possibility of strangulation. When the shades are hung inside one or more windows, they still allow the monkeys filtered light and a slight view of public movement, but the shades greatly lessen their stress. Shades could also be hung on the outside for larger primates that might chew them. If the primates are extremely nervous, you might want to consider using shades on all viewing glass and using scissors to cut a small viewing window. I experimented by cutting an 8' x 15' (20cm x 38cm) window, and the shade held up well (i.e. did not fall apart). Since the shades are easily trimmed, cut them away vertically a little at a time over a period of weeks or months, as the monkeys show a calm, relaxed attitude toward the public.

—Camille Dorian,  
Monkey Zoo, Orinda, CA







# Book Review

## **Self-assessment Color Review of Reptiles and Amphibians**

Frederick L. Frye and David L. Williams

Iowa State University Press

2121 South State Ave., Ames, Iowa

Paperback 192 pgs. \$34.95

*Review by Bill Tabb, Keeper-Reptiles  
Sacramento Zoo, Sacramento, CA*

The press release from the publisher states that "Veterinarians, herpetologists and pet owners will find this self-instructional guide a valuable means to:

- Identify medical problems indigenous to reptiles and amphibians.
- Achieve holistic diagnosis.
- Implement effective treatment."

This is truly the case, although having a medical dictionary while you thumb through the pages of this book would be a good idea.

I showed this book to one of our veterinarians to get her opinion. Her reaction was that this book is aimed at the veterinary student or beginning reptile veterinarian more than lay people. She also said that the authors use a lot of medical terminology and jargon that someone outside the medical field would probably not understand. This is most probably because the book is presented as a self test (as the title would imply) by authors who are both recognized as leading world authorities in their respective fields. While this book is not large, it is packed with information that the reptile or amphibian keeper will find useful. It presents more than 250 case studies using a mix of photographs, photomicrographs, radiographs and histories. Unless the reading is familiar with cytology, medical terminology or can read a radiograph, most case presentations are unclear. The real value to the non-veterinarian keeping reptiles and amphibians comes when using the book to match an existing problem to a case illustrated in the book. It can also stand alone, when using the index, as a medical reference for the special needs of this call of animals. The history, diagnosis and treatment offered for each case can be invaluable in preventing similar problems in your own collection.

I would recommend this book both because of the wealth of information it contains relating to preventive care and the lessons learned from the experiences of other keepers of reptiles and amphibians. This book is sometimes difficult to understand but that should be no reason to exclude it from your professional library.

**Our Living Resources: A Report To The Nation On The Distribution, Abundance, And Health of U.S. Plants, Animals, and Ecosystems**

Edited by Edward T. LaRoe... (et. al.) 1995

U.S. Department of the Interior, National Biological Service,  
Washington, DC 20240

Paperback, 530 pgs.

*Review by Nancy Bent*

*Assistant Librarian*

*Brookfield Zoo, Brookfield IL*

This book, the first of a series of reports on the status and trends of the nation's biota and ecosystems, is intended to bridge the gap between scientists performing field research, the resource managers and policy makers who apply the research, and the general public who enjoy wildlife and the outdoors. It succeeds in this goal, as the information is presented in a highly readable style and is enhanced with numerous graphs, tables, photographs, and other illustrations.

The book is divided into three large sections (Introduction; Distribution, Abundance, and Health; and Special Issues), and further subdivided into groups of articles on such topics as birds, aquatic ecosystems, and the Great Plains. Within each of these smaller sections are an eclectic group of short articles, written by over 200 experts, which address the relative health of the species or ecosystem under consideration. These are followed by a glossary and an extensive index.

The short articles are excellent overviews of the topic under discussion. They are meant as succinct looks at the subject and not as exhaustive treatises, and all contain extensive lists of references. The interested reader can obtain further information by delving into the sources listed, or can contact the authors directly at their addresses given at the end of each paper.

The value of this book is threefold. First, the overview approach on each topic is particularly valuable for those seeking to write or implement policies on the use of wild lands, giving them up-to-date information on the effects of human encroachment on species and ecosystems.

Secondly, it is a snapshot in time, showing the state of the wild in the United States as of 1995. This allows for comparison with future years, and it can act as a starting point or baseline for continuing research.

Thirdly, this book gives the reader an idea of the overall health of the U.S. wild, and should help to mobilize public opinion on the environment. As conservation organizations, the nation's zoological parks are in the forefront of education the general public about why it is important to preserve as much of the planet's ecosystems and species as possible, and we who work in these parks should be as familiar with the state of our own country's environments as we are about rain forests or the giant panda.



The latter is why this book should be part of every zoo library, and should be familiar to every zoo employee who has contact with zoo visitors. It is an excellent introduction to our nation's biological resources, and I recommend it highly.

### **Arena Birds-Sexual Selection and Behavior**

by Paul A. Johnsgard  
Smithsonian Institution Press, 1994  
900 Jefferson Dr. S.W., Washington, DC 20560  
330pp. Hardback

*Review by Christina Smith, Keeper  
Veterinary Services  
Houston Zoological Gardens*

The first two chapters are devoted to detailed and thought provoking explanations on sexual selection and its importance in avian evolution. Sexual selection has lead to sexual dimorphism physically, acoustically and behaviorally. Some male birds have traits that don't necessarily help them survive, but instead give them sexual advantage over other males. Traits that aid in fighting or dominating other males (intrasexual selection), or traits that increase attractiveness to the females (intersexual selection) are thoroughly discussed with excellent and numerous examples. Although the author goes into little depth on theories explaining sexual monomorphism the ideas are available and explained well. Avian social behavior such as arenas, courts and leks has been greatly influenced by sexual selection. Johnsgard uses good examples and easy well explained terminology. The author praises Charles Darwin for the original theories which are still intact over a century later.

Models of various concepts are always translated into tables which help clarify ideas. The author points out that many of these theories are hard or impossible to test in the wild or in the lab. This book contains an extensive glossary for easy reference.

The rest of the book is divided into chapters dealing with specific bird groups: Galliform Birds, Bustards, Sandpipers, Snipes, Ruffs, Kakapos, Hummingbirds, Lyrebirds, Contingids, Manakins, Bowerbirds, Birds-of-Paradise, Whydahs, and Widowbirds. The author includes a comprehensive list of 150 species or genera which contain all the lekking species and dispersed territory birds (bowerbirds) known to the author. The list includes information such as the type of dispersion, display and other dimorphisms.

This book would be a valuable addition to a zoo's library; serving not only as a species reference book, but a book of natural and sexual selection theory. The amazing complicated adaptations that these animals have developed will enhance your sense of wonder of the animal world.

# DISNEY'S ANIMAL KINGDOM: ANSWERS FOR THE CURIOUS

*By Diana Guerrero, ARK Animals, Inc., Escondido, CA*

One of the newer questions on the mind of the zookeeper is what is Disney up to and who is going to be involved? Much has been kept quiet but ground breaking began in September of 1995 and many of the management team have been appointed. Friends and coworkers are being whisked away into another adventure that may revolutionize the industry by the mere design and interest from the public.

Disney's Animal Kingdom is geared to being a level-action adventure park. At five times the size of the Magic Kingdom Park it will be the largest Disney park in the world covering 500 acres to the west of Walt Disney World in Florida. The theme will include past, present, and the imaginative world of life in the wild and the animals in it.

The adventure for guests will begin in one of three major themes: the real life, the mythical, and the extinct. The infamous "Tree of Life" will tower over the park at a height of 14 stories and encompass more than 50 feet in width. It is intended to represent mankind's respect for nature. A closer look at the tree will reveal hundreds of animal forms hand-carved by the Disney artists to form a tapestry of the rich and diverse animal life on earth.

The adventure with live animals will be observed in a safari-like atmosphere with herds of different African wildlife. This viewing will be paired with adventure stories of mystery, danger, and humor that will allow guests to be participants, rather than just spectators, making every encounter an adventure.

The mythical journey will involve the powerful human imagination with animals from legends, fairy tales, and story books. Unicorns, dragons, and other imaginary creatures will come to life with theme park magic and storytelling.

The third exploration will be into extinction and the Cretaceous period. Guests will be able to view the end of the period of dinosaurs through Disney's Audio-Animatronics and travel through a primeval forest to experience that prehistoric period of life on earth.

Disney states their intent is to acquire animals that are captive-born in zoological parks, orphans rescued from endangered habitats or orphans rescued by wildlife officials. In the commitment to animal conservation they also plan to present a Conservation Station which will focus on conservation and species survival activities for the park. This station will provide information on conservation organizations worldwide and should help guests connect with them through their home communities.

Disney created an advisory committee several years ago to share expertise and visions for animal conservation to help the design and development of Disney's Animal Kingdom. Although the theme is fun, the underlying goal is to inform the public about the importance of conservation and habitat preservation in the hopes of motivating them into personal involvement and understanding.

The park is tentatively scheduled to open in the spring of 1998. Front line staff positions are expected to begin to open in mid to late 1997. Staffing is being handled by Salaried Casting at Walt Disney World.

Management positions already filled are: Director (Disney's Animal Kingdom & WDW Animal Programs): Rick Barongi; Director (Conservation & Science): Beth Stevens; Director (Veterinary Services): Peregrine Wolff; Curator (General): Bruce Read; Curator (Birds): Grenville Roles; Curator (Large Mammals): Pending; Veterinarian (Staff ): Pending; and Manager (Animal): Martin Ramirez

*(Information for this article from electronic news releases from the Disney Corporation.)*



# AAZK Publications Available

**AAZK Diet Notebook, Mammals, Vol. 1** - reference work containing 325 diets representing 213 species and subspecies from 14 participating institutions. Diets are arranged taxonomically using ISIS numbers. Comes in sturdy 3-ring D binder. Each Diet Response Form includes common name, scientific name, ISIS number, contributing individual and their institution, how long the diet has been used, whether the animals have bred on this diet, the diet ingredients, preparation instructions, notes and remarks on special considerations, and nutritional analysis (when available). The publication is in its second printing and is copyrighted by AAZK, Inc. Cost is \$40.00 for AAZK members; \$55.00 for Nonmembers; \$70.00 for Institutions. Prices are for prepaid orders and include U.S. and Canadian shipping. Overseas orders should add \$20.00 for parcel post surface shipping.

**Zoonotic Diseases, 2nd Edition** - 40-page reference work details the most common zoonotic diseases, offers guidelines for preventive control and covers personal hygiene and disinfection procedures. Information for each disease is presented in a text format and includes etiologic agent, means of transmission to man, global distribution, alternate or intermediate hosts, human incubation and human symptoms. Cost is \$8.00 for AAZK members; \$12.00 for Nonmembers. Price includes domestic shipping; orders outside U.S. and Canada should add \$3.00 per copy for air mail.

**HALF PRICE - Zoo and Aquarium Professionals: The History of AAZK** - 216-page volume chronicles the history of the American Association of Zoo Keepers, Inc. from its beginnings at the San Diego Zoo in 1967. Includes early evolution of the Association, its projects, programs and committees, the histories of its 70-plus Chapters and its involvement in the highly successful conservation program "Bowling for Rhinos". Cost is \$5.00 for AAZK Members; \$7.50 Nonmembers. Orders outside U.S. should add \$3.00 per copy for postage.

**"What Kind of Animal Are You"** - 40-page collection of zoo keepers' favorite anecdotes about their work, the animals, and the visitors. Produced by the Brookfield Zoo Chapter and edited by John Stoddard. LIMITED NUMBER AVAILABLE. Cost is \$5.00 for AAZK members; \$8.00 for Nonmembers. Non-domestic orders add \$3 for shipping.

To order any of the above, send your name, complete mailing address, phone number, number of each item you wish to order and a check or money order (U.S. Funds only) made payable to AAZK, Inc. Send to: AAZK Publications, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Mastercard or Visa orders accepted by telephone only - call 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada).

*Institutions wishing to advertise employment opportunities are asked to send pertinent data by **the 10th of each month** to: Opportunity Knocks/AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing date for positions available and when setting these dates keep in mind that because of bulk-mail, most readers do not receive the AKF until the middle of the month or later. There is no charge for this service and phone-in or fax listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is (913) 273-1980.*

**CHIMPANZEE CAREGIVER**...one full-time position open. Requires two years of college level course work, two years experience in the care of exotic animals; OR an equivalent combination of experience which provides the required knowledge, skills and ability. Primate experience a plus. Assist in the responsibility of caring for approximately 80 chimpanzees (*Pan troglodytes*) in a breeding colony. Must be willing to make at least a two-year commitment. Excellent benefits. EOE. Applicant must have a negative TB skin test, negative hepatitis B surface antigen test, and evidence of a measles booster or natural disease prior to employment. Send letter of interest (with requested salary), resumé and three letters of reference to: Jo Fritz, Director, Primate Foundation of Arizona, P.O. Box 20027, Mesa, AZ 85277-0027. Position open until filled.

**ANIMAL KEEPER/Utah's Hogle Zoo**...prefer Associate's or Bachelor's degree in biology, zoology or related field and one year of animal experience. Responsible for care of a diverse collection of animals, including daily husbandry, exhibit maintenance, observation and enrichment, as well as assisting in veterinary practices, education, public relations and support aspects of the zoo's operation. Salary is commensurate with experience and ranges from \$15,600.00 to \$23,076.00, with an excellent benefits package. Please send cover letter, resumé and references **by 25 September 1996** to: Kimberly Davidson, General Curator, Utah's Hogle Zoo, 2600 E. Sunnyside Ave., Salt Lake City, UT 84108. Application materials may also be faxed to (801) 584-1770. EOE.

**WORKING MANAGER/COUPLE for Exotic Livestock Ranch**...must be well organized and familiar with maintenance, land planning - management, as well as animal husbandry. Minimum five years experience. The position is live-in as it is more a way of life than just a job. Non-smoking only. Please send resumé with salary requirements and references to: P.O. Box 422617, Kissimmee, FL 34742.

**BIRD KEEPER/Denver Zoo**...requires completion of 15 semester hours of college course work in biology, zoology, or related field plus two (2) years of experience within the last five years in the care, feeding and handling of a variety of birds. Additional appropriate education may be substituted for the minimum experience requirement. A College Transcript is required at the time of application. Possession of a valid Colorado Class "C" or "R" Driver's License at the end of the probation period. Salary range \$23,472.00 to \$34,248.00. Call (303) 640-3946 to request an application. Completed applications must be faxed to (303) 640-1048 **by Monday, 30 September 1996** in order to be accepted. EOE.

**ZOOKEEPER/AQUARIUM**...requires high school diploma and preferably a BS in a related field with one year's work experience. Responsible for care and maintenance of fishes and aquarium exhibits. SCUBA certification desired. Starting pay rate \$9.56 per hour with benefits. Submit resumé **by 30 September 1996** to: Nancy Foley, Director of Human Resources, The Toledo Zoological Society, P.O. Box 4010, Toledo, OH 43609.

**ANIMAL KEEPER**...Smithsonian Institution. the National Zoological Park (NZP) is seeking an Animal Keeper with experience working with exotics and endangered mammals, with specific experience with primates and positive reinforcement training.



Position requires experience in conducting public education programs. May assist in the development of exhibit interpretation programs. Salary range \$10.92 to \$16.60 per hour. For full details please call (202) 287-3102 (our 24-hour/Toucharline Activated/Automated Request Center, press 9, and request Vacancy Announcement No. SIDEU6120 and a full application package. Application must be postmarked **by 21 October 1996**. The Smithsonian Institution is an equal opportunity employer.

**ZOOKEEPER**...Full-time/Permanent. This position involves all aspects of captive animal care, including all classes of animals. Duties include cleaning, feeding, exhibit design, construction, and maintenance, many veterinary-related activities, record-keeping. Some travel opportunities. Will work closely with the Education Dept., including some public speaking. Applicant shall be highly motivated and highly responsible. The FCZ is midway into a \$4 million expansion project including new exhibit space for Bactrian camels, spectacled bears, Persian leopards, North American river otters, and Gelada baboons. New animal care center. Experience in captive exotic animal care preferred. Salary \$5.50 to \$6.00 per hour plus benefit package. Starting date mid-October. Send resumé **by 20 September 1996** To: Randy Scheer, Folsom Children's Zoo, 1222 s. 27th St., Lincoln, NE 68502.

*The following two (2) positions are available at the Utica Zoo, Utica, NY. For either position send resúmes to: Gary Zalocha, General Curator, Utica Zoo, Steele Hill Road, Utica, NY 13501.*

**SENIOR ANIMAL KEEPER**...requires minimum of four year degree in animal-related science field and four year's paid experience working with exotic animals in a zoo setting. Team attitude and the ability to work effectively with people, and interact with the public. Good organizational, supervisory, and communication skills required. Responsibilities include but not limited to complete husbandry of animals/exhibits, record keeping and sea lion training. Assist with movement of animals, implementation of animal enrichment, exhibit design and construction, education and all aspects of zoo-related programs. Competitive salary with benefits based on experience and education.

**ZOO ATTENDANT I/nutrition/commissary**...degree in animal science/biology preferred with experience in nutrition. Must be able to lift and/or carry objects weighing 50 pounds and have an interest in animal nutrition, monitoring diets, and commissary management. Responsible for the preparation of diets, diet research, diet monitoring, and commissary ordering, receiving, and management. Will work in team environment and occasional coverage of other areas. Entry level position. Higher level will be considered for qualified applicants.

**SENIOR KEEPER I**...minimum two year's paid experience and college degree in biology, zoology, animal science or related field or equivalent combination of education and experience. Ability to deal with diverse animal collection - birds, fish, amphibians, reptiles and invertebrates. Responsible for daily care, feeding, exhibit upkeep, record keeping, staff training, coordination of veterinary care and public interactions. Position open until filled. Send resumé and salary history to: Moody Gardens, Attn: Human Resources, 1 Hope Blvd., Galveston, TX 77554.

**ZOOKEEPER II**...the North Carolina Zoological Park is accepting resúmes from keepers for an anticipated opening in the North American section of the zoo. The position involved working primarily with grizzly bear, black bear, red wolf, bison and elk. A degree in biological science, as well as experience at an accredited zoo are preferred. Starting salary is \$18,133.00, increasing to \$19,039.00 upon satisfactory completion of probation, plus benefits. Send resumé and cover letter **by 27 September 1996** to: Human Resources, North Carolina zoological Park, 4401 Zoo Parkway, Asheboro, NC 27203, Attn: Zookeeper II (Fax: 910-879-2891).

**AAZK Membership Application** *check here if renewal [    ]*

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Address \_\_\_\_\_  
City \_\_\_\_\_ State/Province \_\_\_\_\_ Zip \_\_\_\_\_

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Signature \_\_\_\_\_

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**ANIMAL KEEPERS'**  
**F O R U M**



**The Journal of the American  
Association of Zoo Keepers, Inc.**

**OCTOBER 1996**



**ANIMAL KEEPERS' FORUM**, 635 S.W. Gage Blvd., Topeka, KS 66606-2066  
Phone: 1-800-242-4519 (U.S.) 1-800-468-1966 (Canada) FAX 913-273-1980

**OCTOBER 1996**

**Vol. 23, No. 10**

**Managing Editor:** Susan Chan • **Associate Editors/Enrichment Options**

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**Zoo Infant Development Project** - Teri Maas-Anger/Maggie Liguori, Philadelphia Zoo (Birds/Nonpasserines); Jennifer Hackshaw, Lowry Park Zoo and Suzanne Chacon, Costa Rica (Birds/passerines); Jeanne Stevens, Newark Museum Mini-Zoo (Reptiles); Linelle Lone, Denver Zoo (Amphibians)

**Diet Notebook, Mammals, Vol. II** - Susan Bunn Spencer, Rockford, MI

**Incubation Notebook Project** - Scott Tidmus, Sedgewick County Zoo, Wichita, KS

**Exhibit Design Resource Notebook** - Mike Demlong, The Phoenix Zoo, Phoenix, AZ

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## About the Cover....

*This month's cover features the Motmot (*Momotus momota*) drawn by Joan Watson, who works in the Graphics Dept. at Metro Toronto Zoo. There are several species of Motmots which live in the forests of tropical America, and although they vary considerably in size and color, their plumage is always magnificent, with a combination of bright turquoise, red-brown and emerald green. All species possess black markings around the eyes and their long, powerful beaks are slightly curved and have serrated edges. Their diet consists of large insects which they catch on the wing. Motmots build their nests at the end of a long tunnel, usually in a river bank, where they hollow out a round chamber in which to lay their eggs. Such tunnels may be as long as 80 inches and are often extended versions of a burrow abandoned by some other animal. Both parents incubate the 3-4 egg clutch with chicks emerging from the nest about a month after hatching. Thanks, Joan!*

## Information for Contributors

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Articles may be submitted on disk by arrangement with the Editor. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy finish black and white photos **only are accepted**. Color slides should be converted to black and white prints (minimum size 3" x 5" [8cm x 14cm] ) before submission. Clearly marked captions should accompany photos. Please list photo credit on back of photo.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

**Deadline for each regular issue is the 10th of the preceding month. Dedicated issues may have separate deadline dates and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the AKF staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$3.00 each.

# *Message From the President*

Greetings from the Lone Star State!

At the time this issue of the *Animal Keepers' Forum* arrives in the mailbox, many of us will be in the thick of things at the 23rd National Conference in Detroit. For you who are reading this at home while your colleagues are in Detroit, hey, it's in Houston next year!

In Detroit the Association will take some steps to improve the ways we meet the needs of the membership. Change is good and should be accepted as a sign of development. We just need the courage to make the step. Minutes of the General Meeting will be distributed to Chapters in the next couple of months.

I enjoy the effect conferences have on people. Keepers attend conferences and return to their institutions, full of vigor and energy. The people they met and the presentations they attended fueled the spirit of AAZK and the pride of being a zoo keeper. What a shot in the arm!

Now, how do you utilize this new-found power? Get involved. If not Nationally, at the local Chapter level. If you don't have a Chapter, organize one. There are people to assist you. Still no Chapter? Get involved in your zoo education department, with the docent organization, or other volunteers. Help them deliver the message of conservation and educate the zoo visitor.

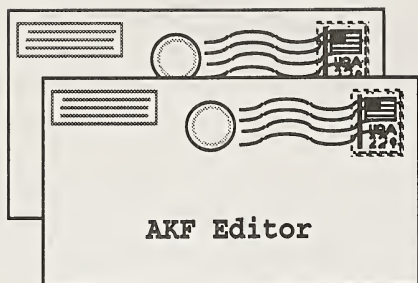
Get involved Nationally. As an individual or as a Chapter, there are many projects that need either manpower or financial support - whether its sending library materials overseas or just donating money for AAZK operating expenses. See you in Houston in 1997!



Ric Urban, AAZK, Inc. President  
Houston Zoological Gardens







## Letters to the Editor

Readers are invited to submit letters to the Editor dealing with material published in AKF or relating to AAZK. We reserve the right to edit letters for length after consultation with the author.

Dear Editor of the AKF:

This letter is in response to the article printed in the August edition of AKF on page 447, entitled Husbandry Alert. It was submitted by Ray Ball, DVM, Topeka Zoological Park, Topeka, KS and the Elephant Management Team. The article describes the onset of profuse, bloody diarrhea, slight anemia, and passing of dark, tarry stools by a 34-year-old Asian cow (*Elephas maximus*) after the introduction of Silver Maple (*Acer saccharinum*) as a browse enrichment item. It continues with a description of the toxic effects of Red Maple (*Acer rubrum*) in connection with horses. The article mentions that the silver maple may have had some local effect on the gastrointestinal tract which resulted in the bloody diarrhea and tarry stools. The article concludes that it is not unreasonable to believe that related species of plants may have the same potentially toxic effects and that serious consideration be given to feeding maple as browse to any zoo mammal. In response, I submit the following for your consideration.

The Plains Biome of the Indianapolis Zoo has operated an extensive "browse collection" program for the last five years. In cooperation with a local tree service, we have collected large quantities of fresh cut browse of a variety of tree species. Browse is collected on an "as needed" and "as available" basis. Often, collecting trips are weekly and result in an estimated 500 to 1,000 pounds of browse being available for

animal enrichment purposes. The browse is made available to all appropriate animals. A partial list includes: Guinea baboon (*Papio papio*); eland (*Taurotragus oryx*); kudu (*Tragelaphus strepsiceros*); reticulated giraffe (*Giraffa camelopardalis reticulata*); addra gazelle (*Gazella dama ruficollis*); Thomson's gazelle (*Gazella thomsoni*); and 0.5 African elephants (*Loxodonta africana*). The elephants receive the bulk of this enrichment item. The varieties collected for consumption have included Crabapple, Apple, Sweet Gum, Norway Maple, Sugar Maple, Willow and Mulberry. The vast majority of collected browse has, however, been Silver Maple. In our experience, none of the animal species listed above have shown any adverse effects that were attributed to consumption of Silver Maple or any other species procured by our browse collection program. We make heavy use of Silver Maple due to its local availability; it is a common local tree which grows very quickly, and our elephants seem to enjoy it. Also, no evidence of its toxicity was noted in any references that were researched. References consulted included "Poisonous Plants of the United States and Canada" by John M. Kingsbury, the 1992 AZH Information Survey and the 1992 AZH/AAZV Toxic Plant Survey. Certainly, our five years of use of Silver Maple without adverse effects supports our continuing use of it as an enrichment item.

Several possible explanations for the situation at Topeka present themselves. The Asian elephant in question may have an atypical reaction to Silver Maple. Possibly

## *Coming Events*

### Association of Zoo Veterinary Technicians 16th Annual Conference

- October 29 - November 1, 1996 in Puerto Vallarta, Mexico. Will include sessions on reptile, avian, primate, exotic hoofstock and aquatic medicine, immobilization, hematology, clinical pathology, hospital techniques and case reports. There will also be a wet-lab. For more information contact: Jenni Jenkins, LVT, National Aquarium at Baltimore (410) 659-4256; fax (410) 576-1080. For membership information contact Lisa Kolbach, LVT at White Oak Conservation Center at (904) 225-3396.

### 24th Annual Conference of the International Marine Animal Trainers Association (IMATA)

- November 3-8, 1996 at Gold Coast, Australia. For further information contact: Steve Romer, IMATA First Vice President, Sea World Enterprises, P.O. Box 190, Surfers Paradise Qld. 4217, Australia 011-07-558-222; fax 011-07-5591-1056.

### 17th Annual Elephant Managers Workshop

- January 24-27, 1997 in Jacksonville, FL. Hosted by Jacksonville Zoological Gardens. For further information, contact: Steven M. Wing, Curator of Mammals, Jacksonville Zoological Gardens, 8605 Zoo Parkway, Jacksonville, FL 32218 (904) 757-4463 or (904) 757-4315 [fax].

### AZA Schools for Zoo and Aquarium Personnel

- February 3-8, 1997 - (Professional Management Development for Zoo and Aquarium Personnel; Applied Zoo and Aquarium Biology; Principles of Elephant Management, Studbook I, Population Management; Science of Zoo & Aquarium Animal Management; and Conservation Education Training Program) will be held at Oglebay Park. For further information, contact AZA Office of Membership Services, Oglebay Park, Wheeling, WV 26003.

1997 Enrichment Conference - October 13-17, 1997 in Orlando, FL. Hosted by Sea World of Florida. For more information, contact: Thad Lacinak, 7007 Sea World Drive, Orlando, FL 32821-8097 USA. Call (407) 363-2651.

the tree in question had been sprayed or received some other extra environmental addition unknown to the elephant staff. Possibly the tree in question was misidentified or was atypical in appearance. It may be possible for Red Maples to hybridize and the resulting offspring to resemble Silver Maple superficially.

Our browse is identified in a three-stage process - first by a professional tree service, then by an experienced browse collection staff member and, if necessary, by a member of our Horticulture Department. If any doubt exists as to the feasibility of its use, it is discarded.

Certainly any other incidents of problems with Silver Maple as an enrichment item need to be documented and reported, but until more substantial evidence is available we urge caution not to make such sweeping generalizations or conclusions that would lead to unnecessarily discontinuing Silver Maple as an important and easily obtainable browse for animal enrichment.

Should anyone be interested in more information about the browse collection program at the Indianapolis Zoo, please feel free to contact me at the following address:

Barrie E. Fields, Keeper II - Plains  
The Indianapolis Zoo  
1200 West Washington St.  
Indianapolis, IN 46222

Tel# (317) 630-2093

e-mail address - bfields@undy zoo.com





# ***ELECTION..... '97***

Hey, Everyone! Do you know anyone who wants to be more involved in AAZK? Well, it's election time again, so put on your thinking cap and put in your nominations for who you want on the Board of Directors. There are three positions open--those held by Ric Urban, Janet McCoy and Michael Illig whose terms expire at the close of the 1997 National Conference. New board members will serve a four-year term from the close of the 1997 National conference until the conclusion of the 2001 National Conference. Nomination Forms may be found in the July 1996 issue of *AKF*, will be published in the November 1996 issue of *AKF*, or may be obtained by contacting Administrative Offices at 1-800-242-4519 (U.S.) or 1-800-468-1966 (Canada). **Deadline for submission of nominations is 31 January 1997.** Nominations should be sent to: Sheri Leavitt, NEC Chair, Houston Zoological Gardens, Children's Zoo, 1513 N. MacGregor Way, Houston, TX 77030; fax (713) 525-330.

## **Duties of the Board of Directors**

For a more detailed explanation of the expanded duties of the Board, refer to the By-Laws (available upon request from Administrative Offices in Topeka, KS).

- 1) Select, appoint or remove officers, committees, agents and employees of the Association, including - prescribing powers and duties.
- 2) To control and manage the Association and its property, passing upon acquisition and disbursements with approval of a majority of the Board.
- 3) To formulate policies, rules and regulations in accord with the Constitution & By-Laws.
- 4) To uphold the Constitution of AAZK and the policies of the Association.
- 5) To appear at Board meetings, to accept Board assignments and to devote the time to communications pertinent to all Board business, including answering correspondence promptly and efficiently.

## **Qualifications for Nomination**

- 1) Nominee must be a Professional Member of AAZK, Inc. in good standing and must have been a member of the Association for at least one year.
- 2) Nominee must be presently employed as an animal keeper/attendant, veterinar technician, research technician or other personnel directly connected with the care, feeding and educational display of captive wildlife in a recognized zoological park, aquarium, animal reserve or other animal care facility in the U.S. or Canada and must have been in the zoological field for at least two years.

## Animal Behavior Concerns & Solutions

A Question and Answer Forum for the Zoo Professional

By Diana Guerrero

Independent Behavior Consultant, Ark Animals of California, San Diego, CA

### Nursery Behavior Necessities

#### Zoo, Nursery & Children's Zoo String: Felids

##### QUESTION:

There have been numerous problems associated with hand-reared babies in zoological gardens. These include not only human orientation or imprinting but higher instances of aggression to keeper staff, animal ambassadors going awry, and difficulties in integration with others of the same species. Can you address this topic?

**NOTE:** Since this is a very complex topic, the next several columns will deal with this issue. If you have specific tips or questions please direct them to AAZK or e-mail ARK direct at [arkabc@ix.netcom.com](mailto:arkabc@ix.netcom.com) for inclusion in this series.

##### BACKGROUND:

The zoological field has made numerous inroads to captive breeding challenges. With the International Studbook Inventory System (ISIS), Species Survival Plan, (SSP), Captive Breeding Specialist Groups (CBSG), Reintroduction Specialist Groups (RSG), and the Taxon Advisory Groups (TAG), etc.; captive mating and pairing has turned into a complex science.

With the current trends in genetic engineering, and the existence of the "Frozen Zoo." The not so distant future will render the sperm of a diabetic drill (*Papio leucophaeus*) as viable for future breeding without passing on that genetic trait.

Another advancement has been in relation to hand-rearing formulas, feeding schedules, and strategies to help avoid imprinting with some species. The "weak link" that remains to be addressed are the behavior strategies that could eliminate difficulties for the animal and his/her keepers down the road.

##### PROBLEM:

The problem facing nursery keepers varies from institution to institution. Sometimes there are strict controls in place regarding the interactions allowed between the high profile infant and the public officials, media, and other related people. Frustrating at times, this does not enable the keeper to provide the best environment possible for the newborn.

Other challenges include a constant flow of the curious or well meaning staff



from around the zoo who engage in less than desirable interactions. These interactions can reinforce and escalate problem behaviors. With guidance this can be turned into an advantage since a wide variety of exposure to different people and experiences can contribute to developing a more stable animal.

More often, the biggest challenges lie within the nursery environment since the skill levels differ from one staff member to another, and the consistency in rearing from a behavior standpoint suffers.

## **ANIMAL PROFILE: FELIDS**

Predatory animals are always a handful, especially as they grow and become more active. Cute little cubs turn into active clawing, climbing, biting whirlwinds. Problems seem minimal in the nursery but unattended they develop into serious challenges for the future keeper of the five-pound cub turned into a 500-pound tigress!

Smaller cats, with their predisposition to be more active and aggressive become dangerous cats that will leap onto faces or other parts of the unsuspecting keeper who may not have the option to lock them out of the exhibit while cleaning.

Ambassador animals that begin approaching sexual maturity, raised without good behavioral guidance, become a handful or cannot be relied upon in group situations or even in a secure show environment. Natural behavior traits become a nightmare in many cases the animals have to be isolated because they cannot be used safely around humans or cannot be integrated back with their own species.

## **PROBLEM BREAKDOWN:**

Concern for the future of an animal is always in the mind of a good keeper. Without practical background or information on this topic it is hard to know what the right thing is to do. Although the breeding behavior of many animals has been studied or documented, other behavior or strategies have not.

Unlike their tame counterparts, cubs or kittens need to be taught how to be gentle (from their perspective not ours!). Most will receive ample guidance and learning from their mother or litter-mates, so as surrogates, the keepers involved in infant rearing must try to assist in this. Where and when do you start? Immediately!

There are several concerns which need to be addressed:

- |                                   |                                              |
|-----------------------------------|----------------------------------------------|
| 1. Consistent rules               | 6. Strategies: desensitization & distraction |
| 2. Clawing                        | 7. Behavior records                          |
| 3. Biting                         | 8. Inadvertent reinforcement                 |
| 4. Jumping & climbing on clothing | 9. Nursery animal companions                 |
| 5. Toileting habits               |                                              |

## **CONSISTENT RULES:**

Having consistent rules is a very important strategy. It is the one way that you can develop consistency throughout your department and with visitors. The general rule is to teach the animal as a cub those rules which will make them a desirable adult. i.e., the five-pound lion cub is taught manners because they will grow up to be a five hundred pound aggressive lion if they are not; or the small little margay becomes the missile bouncing off the wall with claws and teeth working overtime when excited.

Working in private facilities before zoological work, I found that the rules were set so that the cub being worked with at the time would not be interpreted as a rogue adult by some fearful trainer sometime down the road. Playtime was carefully directed; no mouthing, clawing, or other such behaviors were acceptable. As soon as the eyes started to open, training on these rules began.

This means the rules of interacting with the human keeper or caretaker will include: no jumping, climbing on clothing, skin (ouch!), no playing with hair, no biting, understanding words such as "be easy", "gentle" or "no."

Babies are trained through example and cause and effect, in short simple interactions instead of formal sessions. Everything is reinforcing or reprimanding and all the little things are important details to consider for their future benefit.

## **CLAWING:**

This is probably the most annoying behavior since young animals will knead with their claws in early stages. Care should be taken to use a barrier over the leg or surface that the cub is placed on to nurse. This is an innate behavior which can be redirected at later stages.

Once the cub gets older, objects which are acceptable to claw on should be provided. These need to be items which will be acceptable at later ages in exhibit yards or interior holding areas. Logs, and other items are ideal. Check with your facility to see what the targeted exhibit for the animal provides or allows; or establish communication with the facility the animals are scheduled to be transported to.

Claws unsheathed as a cub plays or climbs can be a problem. This is another innate behavior since cubs will often climb all over their mothers and litter-mates. Keepers should wear protective clothing and discourage this type of behavior early on. Play can be redirected into other activities through distraction, use of martial art type blocks and barriers.

Pairing words with teaching behavior is important. These animals are very socialized to humans and more individualized than their conspecifics that are mother-raised. When a cub extends the claws in a manner that is unacceptable, gentle holding of the paw while the claws are unsheathed can be paired with mild pressure, and the words "be gentle" or "be easy"; this can teach the youngster to sheath their claws. Not pulling away is also important to minimize conditioning clawing and kicking.



Also, care should be taken to avoid playing with these animals as domestic kittens. Active tummy scratching and play will trigger rougher play. This should be redirected into other types of play. There is a need for active play and "rough and tumble" activity, however it ideally should not involve the keeper. Substituting toys, things to chase and playmates are ideal substitutes.

### **BITING:**

This can evolve into a big problem for obvious reasons. Cats at a young age should be taught that biting is inappropriate on humans! Again, redirection to other objects is desirable. The easiest way is to push their mouth away and distract them into something else. Play biting is not acceptable on a human at any time!

When working with animals I have found that letting out an "OUCH!" and not reacting often has a good effect on young playful animals in low levels of excitement. In play, when they experience this type of response from littermates (high pitched meow) or the stronger response from their mother (growl or snarl) they will naturally stop. Distraction can then be used by the handler to redirect this. Some animals with stronger personalities or wills find this fun! Discernment in knowing the difference on how to handle these "handfuls" is a critical skill in nursery staff.

The older methods of handling this require that sometimes a gentle pop on the tip of the nose with a finger paired with a verbal "no" or "no biting" or "be gentle" and it works. Natural mothers will cuff a cub pretty harshly if they get too rough or out of line. In most cases with exotics, aggression will breed more aggression, so this discipline must start young and be very clear, otherwise the cubs will "test" the rules and come back stronger each time.

Other strategies, also from the old school, include placing their mouth edge (if they have one!) between their teeth and your skin when they bite, or creating a gagging reflex when they bite. This activity has associated risks and is not recommended. If used, most handlers only do so when the cubs are very, very young.

The best method is preventative and started young! Also, low level restraint by grabbing the back of the neck and relocating a cub or giving them a time-out or opportunities to release the energy elsewhere is the ideal strategy. Care must be taken to not inadvertently reinforce the behavior.

If the cat is older and testing the limits, sometimes they will continue to press the issue and not back off. Your best bet is prevention by watching the behavior patterns and being aware or predicting when this behavior is escalating; handle it before it becomes a problem by putting the cub away, leaving, or redirecting the energy.

**NOTE:** Be careful not to reinforce this behavior by withdrawing from it once it has developed! You will have to have a strategy to deal with it to see it through completion.

## **JUMPING AND CLIMBING ON CLOTHING:**

This is another behavior that should be started from a very young age. Not turning your back on the cub(s) when exiting and entering an enclosure are important behavior patterns so that you do not trigger the natural instinct to jump and attack!

Climbing can be stopped by placing your hand over their head and not allowing the cub to climb, by peeling them off of you and restraining by a "behind the neck hold" while doing it, or by the use of other barriers or predicting the behavior and redirecting it into other play.

Chase games with objects that are attached to a pole and other toys to help with this type of distraction are recommended. Again, prevention and early training are important. Also, remember that certain interactions will stir up the activity level. For instance, olfactory stimulation can get a cat wound up; or for water babies, a pool can get them going.....be prepared to deal with those possibilities.

## **TOILETING:**

This is something that many cats are responsive to. Having an area for them to utilize for this purpose is ideal. Many facilities, especially with small felids, will use wood chips or shavings, clay litter, or other such materials to encourage or train cats to defecate or urinate in them. Many cats, such as tigers, will use a low or recessed water bowl or similar substitute to both urinate and defecate in. Most cats will also engage in normal marking behavior but it is considered a perk to have some training options in various institutions.

## **STRATEGIES: DESENSITIZATION & DISTRACTION**

These are two very important tools to use when working with any type of animal. Both strategies if used and implemented can develop an animal into a stable controllable ambassador or exhibit animal. When not used, the animal will remain reactive, less predictable, and unworkable compared to their buddies who have had the benefit of such training tools.

Desensitization is teaching an animal to ignore or accept new environmental changes, people, or events with little trauma. The more people, new areas or things the animal is introduced to, the more secure and less reactive or volatile they will be. This is critical for ambassador/show animals! A potential fearful encounter is approached by the human handler first, the handler will encourage the cub to approach and explore (not force), later this object encountered will not create that fear response.

Distraction is a strategy used to distract the animal away from one activity into another. It is used before the undesired reaction evolve into a behavior. For instance, a play attack is directed into another play activity, or a potential problem is averted by a noise, presentation of another object, etc.

## **BEHAVIOR RECORDS:**

Oh no, not more work! This is one of the most critical logs you can keep on your



animals. It can relay critical information to other keepers or trainers down the road. You never know when this type of information will be critical to the well being of another keeper, to other animals or to the individual animal that has left your care.

Noting dislikes, likes, problematic behavior, and strategies used to deal with them are important clues to working with this animal down the road. It can also help decipher problems too. For instance, one tiger who was hand-reared by females did not do well with male keepers. In order to enable that animal to adapt well and to fit into the zoo environment it was important to know that information since he reacted poorly to males but not females. Without that information the animal can experience difficulties and trauma that could have been prevented had the records been sent with him.

### **INADVERTENT TRAINING:**

This is training by accident. If an animal acts aggressive or gets unruly they often get put away or are allowed to engage in whatever they want. So they learn that behaving certain ways will get them what they want! Not a good thing to teach in a captive wild animal!

Cubs moved to a new area for public viewing hiss and snarl at the public. They run to you for protection....do you touch and comfort them? NO! Why? Because you would be reinforcing a fear reaction. Just talk to them and let them sort it out. Soon they will ignore the public and be desensitized to the whole adventure.

### **NURSERY ANIMAL COMPANIONS:**

Having the same species or different species of the same family can be an advantage in sorting through some of the natural behavior challenges you encounter. Felids can romp, bite, and chew on their littermates or playmates and fulfill that natural urge to play and learn behavior etiquette between animals.

Hope these ideas are useful to helping you sort through the behavior challenges of cubs and providing the best conditions for your "children" to develop and learn in. Feel free to send in any additional information you find useful or want to share.

### **NEXT MONTH: Nursery Behavior Necessities: Pachyderms**

*(About the Author: Since 1978 Diana has been active both in the U. S. and England working with zoos, private collections, an oceanarium, a marine aquarium, and other animal-related organizations involving captive wildlife. She has a broad base of animal experience involving movie & television training, zookeeping, show performances with live animals, education, behavior management, modification and enrichment, rescue and rehabilitation as well as captive breeding and management of endangered species. She currently works as an Animal Behavior Consultant and Trainer for Ark Animals of California working with both exotic and domestic animals. She has authored numerous articles on animal behavior and training. If you have questions for Diana, you may contact her at 1-800-818-7387 or visit her Home Page at <http://www.ni.net/brookhouse.com>)*



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## **AAZK Announces New Professional & Contributing Members**

Katharine Schofield, National Zoological Park (D.C.); Charlene Mauro, Sea World of Florida (FL); Suzanne Crandall, Avicultural Breeding & Research Center (FL); Jacqueline Walker, Nashville Zoo (TN); Rose Ready, Hattiesburg Zoo (MS); Jennifer Starkey and Matt Biglin, African Safari Wildlife (OH); Lisa Oland, Indianapolis Zoo (IN); Renee Vachon, Ft. Wayne Children's Zoo (IN); Gloria Copeland, Detroit Zoological Institute (MI); Scott Wahlberg, Roosevelt Park Zoo (ND); Amy Burns, Omaha's Henry Doorly Zoo (NE); Kathryn K. Waller, Alexandria Zoological Park (LA); Susannah Corona, Sea World of Texas (TX); Kirk Taylor, Willow Park Zoo (UT); and Karen Hamilton, Metro Toronto Zoo (Ontario, Canada).

### **Renewing Contributing Members**

Janis Clark, Orchid Tree Exotics,  
Swanton, OH  
Janet Sadler Schmid, Little River Zoo,  
Normal, OK  
Carol N. Wright, Dallas Zoo,  
Dallas, TX  
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**AAZK, Inc.**

**635 S.W. Gage Blvd.  
Topeka, KS 66606-2066  
U.S.A.**



# 1996 AAZK and Animal Keepers' Forum Awards

The following awards were presented at the 23rd National AAZK Conference held in Detroit, MI from 6-10 October 1996. The Jean M. Hromadka Excellence in Zoo Keeping Award is selected by the AAZK Awards Committee from nominations submitted from the membership. Janet McCoy, Metro Washington Park Zoo, Portland, OR chaired the Awards committee this year. The Certificates of Recognition and Appreciation are given by the AAZK Board of Directors. The Excellence in Journalism Awards are selected by the editorial staff of *Animal Keepers' Forum*.

## **The Jean M. Hromadka Excellence in Zoo Keeping Award Recipients**

*In recognition of their professional attitude, true dedication, superb application of animal husbandry practices and contributions to the welfare of the animal life placed in their charge, AAZK, Inc. presents the following individuals with this award:*

### **Jennifer Hackshaw, Lowry Park Zoological Gardens, Tampa, FL**

*For her outstanding efforts in the husbandry of the animals in her care, work with the breeding facility and contributions to the construction of night facilities for macaws. Specifically noted was her work in creating graphics for the free-flight aviary.*

### **Linda King, Dallas Zoo, Dallas, TX**

*For her outstanding efforts in the husbandry of the animals in her care, committee work, instructing staff and volunteers and contributing to the chimpanzee exhibit design team. Specifically noted were her contributions to behavioral enrichment.*

### **Jim Sampson, National Zoological Park, Washington, DC**

*For her outstanding efforts in the husbandry of the animals in her care. Specifically noted was her work in educational programs, especially the "Life" program.*



## **Certificate of Recognition Recipients**

**Rachel Rogers, El Paso Zoo, El Paso, TX**  
*in recognition of her service as Chair of the AAZK  
Inspections Standards Manual Committee*

## **Certificate of Appreciation Recipients**

**Detroit Zoological Institute, Royal Oak, MI**  
*in appreciation for serving as the Host Institution for the  
23rd National Conference of the American Association of Zoo Keepers, Inc.*

**Christine Joy Pratt, Honolulu, Hawaii**  
*in appreciation of her support of AAZK's Bowling for Rhinos Project  
through her donation of artwork used on the 1996 Bowling for Rhinos Poster*

**Robert J. Wiese, PhD.**  
*in appreciation of his support of AAZK in its efforts to  
educate its membership on all aspects of the AZA Species Survival Plan  
and make keepers aware of how they can contribute to this project's success.  
AAZK is especially grateful for his willingness to host workshops on  
topics relating to conservation at AAZK National Conferences.*

## **Distinguished Service Plaque**

*was presented to the*  
**Detroit Chapter of AAZK, Inc.**  
*for their service as Host of the 1996 AAZK National Conference*

## **Excellence in Journalism Awards**

*Outstanding Recognition: "Animal Husbandry Record Keeping  
Using Computer Databases"*

**Greg Shortess, Oregon Coast Aquarium, Newport, OR**

*Outstanding Recognition: "Management of Captive Black-tailed  
Prairie Dogs Utilizing Natural Patterns of Dispersal"*

**Taylor Edwards, Arizona-Sonora Desert Museum, Tucson, AZ**

*Outstanding Recognition: "Problems and Solutions Involved in  
Breeding, Hatching and Rearing the Crested Screamer"*

**Susie Haeffner, Denver Zoological Gardens, Denver, CO**

*Outstanding Recognition: "Initiating a Training Program with Gorillas at the North Carolina Zoological Park"*

**Lucy Segerson, North Carolina Zoological Park, Asheboro, NC**  
**Gail Laule, Active Environments, Lompoc, CA**

*Outstanding Recognition: "The History of the Houston Zoo Enrichment Committee"*

**Christina Smith and Sherri Blumer Garz**  
**Houston Zoological Gardens, Houston, TX**

*Outstanding Recognition: "Herd Interactions of Chacoan Peccaries: Costs and Benefits"*

**Daniel M. Brooks, Houston Zoological Gardens, Houston, TX**

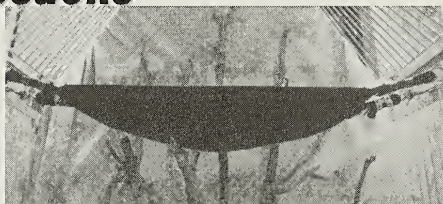
*Outstanding Cover Art: Tufted Puffins (Lunda cirrhata)*

**Gabrielle E. Sivitz, The Academy of Natural Sciences,**  
**Philadelphia, PA**

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# ***Turbo's Triumph: The Cooperative Raising Of A California Sea Lion Pup***

By

*Patricia Shoemaker, Large Mammal Keeper  
Houston Zoological Gardens, Houston, TX and  
Patricia M. Hainley, Ellen Trout Zoo, Lufkin, TX*

## **Introduction**

Having only a few successful California sea lion (*Zalophus californianus*) births, the birth of a sea lion pup at the Houston Zoological Gardens was a welcome event. The male pup, Turbo, was born in the early morning hours on 25 June 1994. After observing the mother and pup pair for the first few days, it was clear that some form of assistance or intervention had become necessary. Upon examining all of the common theories and practices used at other institutions, it became apparent that our own method would have to be developed to meet all the criteria of our unique situation. This article will explain our potential barriers and present the solutions we found in cooperatively raising a California sea lion pup and in weaning the pup without aggressive intervention. It is understood that every new arrival is unique and that animal husbandry is always a dynamic field; however, it is hoped that some of our experiences will prove useful to other institutions faced with a similar situation.

## **Problems**

This was Gertie's first live birth (her previous pregnancy resulted in a stillborn in February of 1992) and combined with being a 12-year-old female only created the first of many challenges that we would face. As if being a first-time, older mother was not enough, Gertie is also a regurgitating animal who will spend one hour or longer focused on this behavior after a feeding. It was hoped that the pup would divert her attention from regurgitating, but the distraction only lasted three days and later increased in both duration and frequency. Instead of being off feed for four to five days as with most other females (Florence, 1988), Gertie only missed one day of eating, and she was not only eating, but willing to be trained as well.

The pup presented abnormal situations as well. First of all, at 7.1 kg (15.7 lbs.) he was underweight at birth. The pup also seemed quite independent. Along with his independence, the pup swam from four days of age with an incredible amount of skill and grace as compared to other pups the same age.

In addition to the challenges the sea lions presented, there were personnel and facility problems as well. The Houston Zoo originally had a section which included personnel for both elephants and sea lions. At one week of age for the pup, the section gained four new employees. By the end of the pup's third month, the section staff then divided in order to facilitate better care for the animals. These staff changes included changing the primary trainer for the mother, Gertie.

Similarly, at the beginning of October our facility underwent a facelift which forced both the keepers and the animals into a smaller holding area.

The combination of all of these factors formed a very unique situation for us. It was obvious to all of the staff that some form of intervention was needed. Which form of hand-raising and what level of action was required was still undecided.

### **A Course of Action**

For the above reasons it was obvious that the female, Gertie, would not be able to accomplish the task of being a mother without some outside help. The easiest choice at this juncture would have been to hand-raise the pup. Since Turbo was a male pup, it complicated the hand-rearing issue. After hearing about the horrors of imprinted male sea lions, in addition to the staff not being able to focus solely on the sea lions at the beginning, hand-rearing the pup was not a valid option. Gertie was still allowing the pup to nurse, and milk had been observed during nursing. There seemed to be some maternal instinct and bond. The decision was made to maintain the mother-pup relationship for as long as possible without jeopardizing the health or the life of Turbo. The compromise, between the two extremes of pulling the pup and "just waiting", was for the keepers to assist Gertie in every way possible with the raising of her pup.

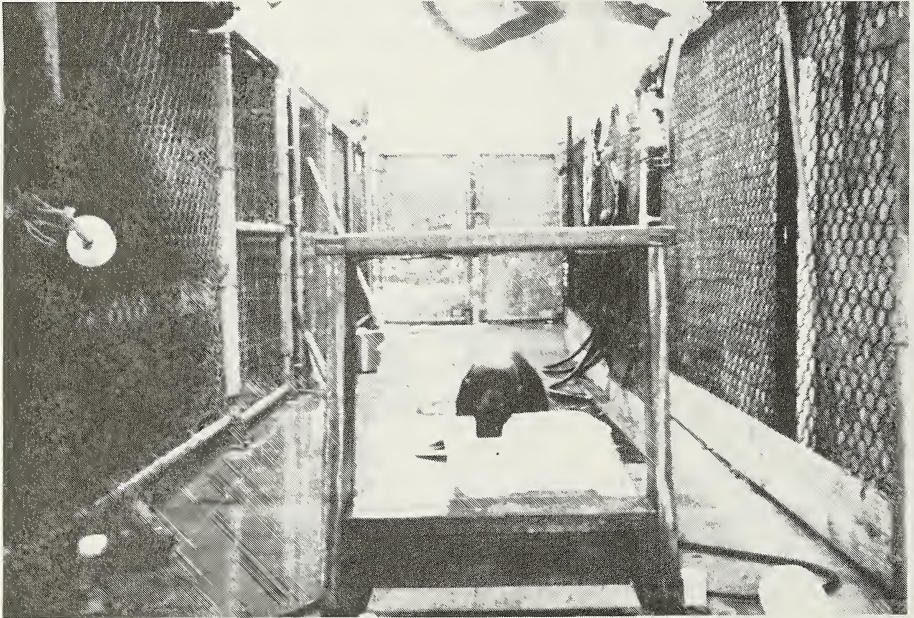


**Author Patti Shoemaker and Turbo during an early feeding session. Eating was made a fun game using the white tub and blue scoop in order to keep his attention focused. (Photo credit: P. Hainley)**



## Plan A

After observing the pair for the first few days, it seemed that Gertie did not spend enough time focused on her pup. She chose to swim, eat, perform in shows, and regurgitate over nursing the pup. Since all of these preferred behaviors are reinforcing in some manner, why not make nursing a highly reinforced behavior? Hence, nursing training sessions began. The trainer would ask Gertie to roll over and bridge and feed for her allowing the pup near her, and later for allowing the pup to nurse. By cutting her fish smaller we were able to extend the sessions for a longer period of time and, by adding another session to accommodate her increased diet, we were able to assure the pup five good nursing bouts a day. The pup, however, began to drop weight.



**Turbo's first weighing on the adult scale; he weighed 42 lbs. (19kg), Notice the use of a familiar and positive item (white tub) to introduce this new concept. (Photo credit: P. Hainley)**

## Plan B

Since it was apparent that Gertie was unable to maintain the pup's weight with the amount of nursing she would allow along with his unusually high levels of activity, the situation was reevaluated. The next step of intervention was a necessity.

If the pup would take a bottle, his diet could be supplemented once or twice a day with Multi-Milk™ while still staying with his mother. In the beginning, the hope was that Turbo would take a bottle and that his diet could be supplemented with one or two feedings per day. After a few unsuccessful



attempts at getting the pup to accept a bottle, the idea of bottle feeding was abandoned. The problem remained, the pup continued to lose weight.

## Plan C

Since bottle feeding was unsuccessful and intervention was still deemed necessary, tube feeding was our only feasible alternative. As expected, the beginning few weeks were quite stressful for all involved. Once a consistent routine was established, the following weeks of tube feeding went smoothly. The routine went as follows: 1) place a towel over Turbo's head, 2) gain control of his head and neck, 3) place him in a pillowcase, 4) weigh him on a hanging scale, 5) use your body weight to hold him down, 6) remove pillow case, 7) tube feed. In order to boost his weight immediately, Turbo was tube fed 8oz.(237 ml) of Multi-Milk™ twice daily, once in the a.m. and once in the p.m. After two days, the tube feedings were cut to once a day. The pup's weight steadily increased throughout the tube feeding process.



**The author and Turbo during a later feeding session. The initial goal was to establish a consistent dietary intake from the keepers' hand before any training restrictions were placed on him. (Photo credit: P. Hainley)**

## Weaning

Once his target weight of 18kg (40 lbs.) was reached, tube feeding was discontinued. Turbo was already four months old. This age began the key "window" of time to start introducing fish. The goals of introducing fish were to peak Turbo's interest in fish and to get him to swallow without creating any undo stress for mother or pup. The plan developed at this time was centered



around making fish a game and fun for Turbo. A variety of fish enrichment items were developed to stimulate his interest and desire in eating. These items included the following: bucket size fish pops, both plain and fish gut ice cubes, and live goldfish. Some of these items resulted in interest and play from Turbo; namely the fish pops and the regular ice cubes. As with the keepers, he did not enjoy the fish gut ice cubes. Live goldfish were the most popular with Turbo. He was given the goldfish in our holding pools (approximately the size of a small hot tub, five foot round). In the pool he would play with the fish for hours, but did not appear to be ingesting any. Observing and counting the remains was difficult for the keepers. The live goldfish were then placed in a small white tub. Once Turbo was eating approximately 20 goldfish per day, dead goldfish slowly replaced the live fish. Small pieces of capelin, squid, and whole lake smelt were introduced along with the dead goldfish. Soon Turbo was eating two or three pounds of fish per day in addition to his continued nursing.

At this time, Gertie began to show neurotic behavior and aggression toward her pup. In order to alleviate stress on her, and to provide more opportunity for feeding the pup, Gertie was released to the main pool during the day and brought into the holdover area at night. Although the pup was eating consistently, his activity level was low at best. He spent most of his day sleeping under the decks of the holding area. Thus it was decided to increase his activity level and to stimulate his appetite by releasing him to the main pool. All attempts thereafter to separate the mother and pup became extremely stressful to both animals. Hence, all intervention (aside from routine weighing of the pup) was discontinued until the social situation stabilized. During this time his nursing bouts were observed to increase and his weight remained stable even though he did not eat any solid food at this time.

Shortly thereafter, on several occasions, keepers observed the pup not only regurgitating but reingesting rocks, foreign matter, and mucus. He was radiographed at our clinic only to find a stomach full of rocks, coins, and other objects. The next day, on 5 January, he was sedated and the metal objects (which included 42 cents, a metal brad, and a screw) were removed through flexible endoscopy. He returned to the holdover and treatment began for zinc poisoning (injections BID of Ca EDTA). At this time Gertie was shifted into the holdover area, to allow Turbo the comfort of nursing. Turbo continued to clear his system of rocks by either passing them in his stool or regurgitating them.

Throughout the weaning process, Gertie began to develop open sores in her mouth. In December, she was sedated and had four teeth removed. The sores continued to develop, and by 20 January she was taken to the clinic for closer observation by our veterinary staff.

## **Hand Feeding**

Moving Gertie to the clinic forced the weaning process. Every opportunity was taken by the staff to reintroduce Turbo to solid food. Simultaneously, he was reintroduced to the other sea lions to meet his social needs. A variety of fish

games were developed and tried. These included fish pops, ice cubes, the white tub, salt, etc. Turbo was playing with the fish, but he was not eating a significant amount. Upon discussion with other zoo staff, a new method of action was tried. Since he showed an interest in playing with the fish, keepers began instigating a new game involving squid in a "tug of war". Within 24 hours, he began eating solid food from our hand. Two weeks later he was eating nine pounds of fish a day.

## Training

Because his appetite was consistent, behavioral control was our primary focus. A protocol was developed for feeding time. He responded well to his new rules and schedule so bridge-target training began within two weeks of weaning. He learned the concepts of bridge-target training and now has a repertoire of almost 30 behaviors including all basic husbandry behaviors such as full body tactile, lie down, and flipper presents. A month after he began target training, he was released to the main pool and continues on the same routine as the adult sea lions.



**Senior Keeper Robert Greene and Turbo during an early training session. Once Turbo was eating consistently, his training began and was focused solely on manners and proper body positioning. Photo credit: P. Hainley)**

## Conclusion

The birth of Turbo brought excitement along with anticipation and challenges. To provide the best possible care for Turbo, not only has our staff joined together and combined ideas from other sources, but we were also forced to use our imagination in forming new techniques. It has been a learning experience for



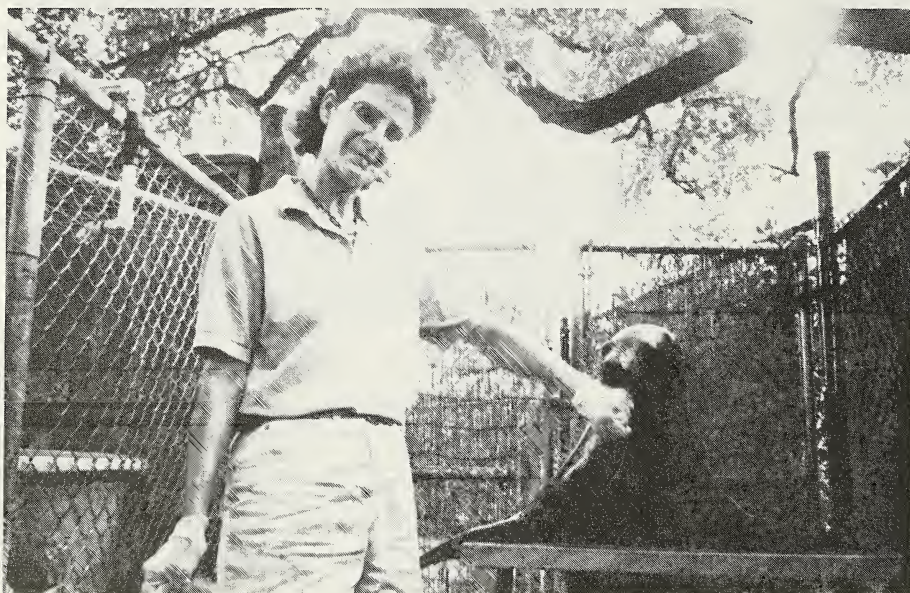
all of us and it is hoped that our situation will provide information for other institutions as well.

## **Acknowledgments**

Raising Turbo was a team effort, so I would like to thank the Sea Lion staff at the Houston Zoo; especially Patricia Hainley without whom I could not have finished this paper. I also thank my curator, Diana Weinhardt, for her input and suggestions.

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**Co-Author Patti Hainley and Turbo during a later training session. He quickly learned the concept of 'bridge and reward' and his repertoire of behaviors increased dramatically.** (photo credit: P. Shoemaker)



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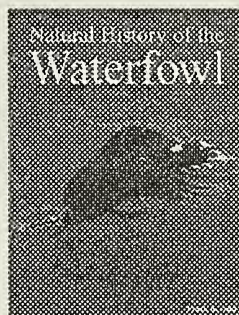
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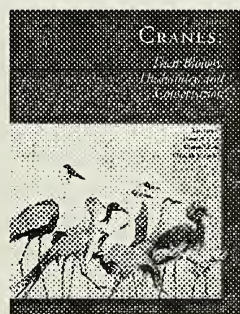
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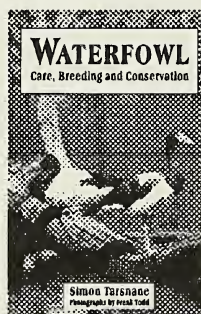
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# Biology Of The Jaguar

## Part One

By  
William K. Baker Jr., Zoologist  
1209 Tom Temple Dr., Lufkin, TX 75904-5560

### Introduction

The biology of the jaguar (*Panthera onca*) has been little studied until recently. This fact is quite remarkable considering the fact that the jaguar is the third largest living cat in the world and the largest New World cat in the Americas. Its geographic distribution covers a large part of Mexico, all of Central America, and South America as far as northern Argentina. The exception to this is in Uruguay where it has been extinct since the early 1900's and in the Southwestern United States where they are occasionally found on the U.S.-Mexico border. Information preceding 1970, when available, consisted mainly of anecdotes and notes on its natural history (von Humboldt 1805-1937; Rengger 1830; Azara 1838; Roosevelt 1914; Cherrie 1930; Miller 1930; Krieg 1948; Wavrin 1951; Kulhorn 1955; Leopold 1959; Sick 1960; Brock 1966; Hoogesteijn and Mondolfi 1982).

Since that time a number of papers have been published on the jaguar. A study of the adaptive differences in the body proportions of large felids was addressed by William J. Gonyea (1976) who compared body proportions in eight large felids to determine whether functional differences due to morphological variation could be correlated with different behavioral and ecological strategies. Schaller and Crawshaw (1980) started a study using radiotelemetry in April 1978 at the Acurizal Ranch in the Pantanal Region, State of Mato Grosso, Brazil. The status of the jaguar in the Southwestern U.S. was addressed by David E. Brown of the Arizona Game and Fish Dept. (1983). This paper dealt with a historical overview of jaguars that had been killed in Arizona and New Mexico and resulting long-term population dynamics. The use of drugs to control estrus in female *Panthera* species in captivity has been tested (Gardner, Hueston, Donavon 1985). Further study of the ecology and behavior of the jaguar was conducted in the Cockscomb Basin of Belize by Rabinowitz and Nottingham (1986).

The first truly comprehensive paper on the biology of the jaguar as a whole was presented by Mondolfi and Hoogesteijn (1982). Their study of the biology and status of the jaguar in Venezuela was the first to integrate all aspects of the jaguar's biology into a concise format. This is not to say Schaller's work (1978-1980) is unimportant; his was the first in-depth field work of a scientific nature performed with the jaguar and still remains the standard by which all other work is measured. Literature about jaguar hunting is another source of data on the biology of the jaguar: "Through the Brazilian Wilderness" (Roosevelt 1914), "Jaguar Hunting in the Mato Grosso" (Almeida 1976), Peter Hathaway Capstick in his long running series: "Death in the Long Grass (1977)", "Death in the Silent Places" (1981), "Maneaters" (1981), "Death in the Dark Continent" (1983), "Safari" (1984).

## Jaguar Characteristics

The Jaguar is similar in appearance to the leopard (*Panthera pardus*) but has a more robust body, a larger and broader head, larger paws, a shorter tail, and stands lower to the ground than the leopard, even though it weighs considerably more. Physical characteristics of the jaguar are typically obtained by examination of specimens killed by hunters and "vaqueros" (ranch hands) (Mondolfi and Hoogestijn 1982; Schaller and Crawshaw 1980) and occasionally raided poacher camps (Schaller and Vasconcelos 1978). Specimens were also captured using live bait traps and darting techniques (Rabinowitz and Nottingham 1986; Schaller and Crawshaw 1980). Weight for males averaged 65-121 kg (143-266 lbs) and for females 65.5-75 kg (144-165 lbs). The total body length for males averaged 189-234 cm (6.5-7.5 ft) and for females 176-203.2 cm (5.5-6.5 feet). Tail length for males averaged 33-68 cm (13-27 inches) and for females 59-66 cm (23-26 inches).

However, specimens have been recorded that were significantly larger. One large male killed at Cordereno, State of Barinas, Venezuela, reportedly weighed 145 kg (319 lbs). Another large male killed in 1959 at El Rosero, State of Apure, Venezuela, weighed 148 kg (326 lbs). Peter Hathaway Capstick reports having seen a photograph of a jaguar on a set of cattle scales weighing in at 209 kg (460 lbs) while he was hunting in Brazil. However, this does not appear to be irregular, but the norm in the Mato Grosso Region. What would be considered a large jaguar in Mexico at 90.72 kg (200 lbs) would be small in comparison to a Mato Grosso jaguar that would weigh 158.76 kg (350 lbs) or more. Brazilians claim that the range in size differences can be attributed to localized races of jaguars that are influenced by varying genetic or dietary conditions (Capstick, 1981).

Three distinct types of jaguar are recognized:

1) **Tigre Mariposa**, identified by spots that form large rosettes resembling butterflies (mariposas). This type in its largest form is found in the Mato Grosso and San Paulo States of Brazil and has been identified by the following scientific names:

<i>Panthera onca palustris</i>	(Ameghino)
<i>Panthera onca paraguayensis</i>	(Hollister)
<i>Panthera onca milleri</i>	(Nelson and Goldman)

2) **Tigre Pinta Menuda**, identified by smaller rosettes, thus its local name of minute spotted jaguar.

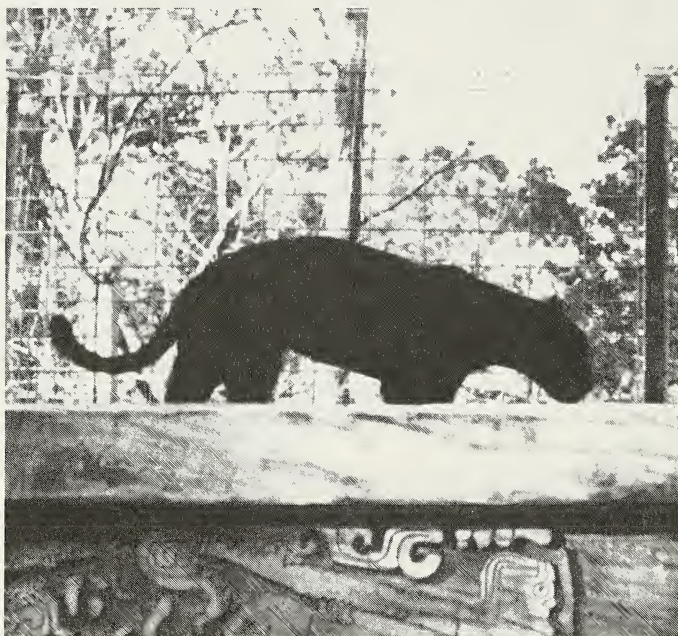
3) **Tigre Negro**, identified as a melanistic individual whose peltage is a blackish-brown to black with markings visible in oblique light. This color phase is a result of an accumulation of pigment and appears to be a recessive trait that follows Mendelian genetic rules (Rich 1976); this type has been principally found in the Xingu Basin (Capstick 1981) and the Caroni Watershed (Mondolfi and Hoogestijn 1982).

[Tigre Mariposa has one reported subtype that is found in the Xingu Basin Region of the southern Amazon and also produces the largest males in the region. This subtype is referred to as **Tigre Cangucu** and is identified by a rosette conformation resembling of "swallow wings" (Capstick, 1981).]



## History Of The Jaguar

The jaguar is the mightiest carnivore in its range and inspired the awe of the people who shared the land with it. To pre-Columbian people the jaguar was a deity. Approximately 2500 years ago a race of farmers, the Olmecs, carved likenesses of the jaguar into statues of jade and stone and even carved human figures with jaguar heads. It is believed that the Olmecs were ruled by the earliest of the jaguar cults. Mayan high priests, who possibly could have been descendants of the Olmecs, took to wearing jaguar robes.



**The photo at left shows the melanistic phase of the jaguar. This 10-year-old 1.0 jaguar is named "Itzamna".**

**The photo below shows the more common rosette pattern seen in this species. This six-year-old 0.1 cat is named "Yaxchilon".**

*(Photo credit: W K B Graphics)*





The Mayans created a highly advanced civilization that was recognized for exceptional achievements in mathematics, astronomy, and medicine. They constructed a towering temple in the Guatemalan city of Tikal which still stands today. Pre-Incan civilizations also worshiped feline gods with carved and painted heads that seemed to depict jaguars. The Aztecs of Mexico, who had a warlike society that practiced ritual human sacrifices, contained the Jaguar Knights, who were considered to be heroes among their warriors. The name "jaguar" actually comes from an American Indian word, jaguara, which translated means "a beast that kills its prey with one bound". The name "El Tigre" (the tiger) was the name that Spanish explorers of the New World gave to the jaguar and is the most prevalent name used by "tigreos" (professional jaguar hunters), "baqueanos" (guides), "vaqueros" (ranch hands), and "campesinos" (farmers).

## Distribution

The jaguar is a rather cosmopolitan creature. Its range once extended from Florida north to Arkansas, west to California, and south to northern Argentina. Today it is unusual that one is found north of Mexico. The last jaguar killed in New Mexico was 1905; the last jaguar taken in Arizona was in 1971 (Brown 1983). Most specimens taken in recent years were males and were found in Madrean evergreen-woodland, shrub-invaded semi-arid grasslands, and river bottoms (Arizona Game and Fish Dept., 1983).

Until recently, the prevailing opinion has been that jaguars that have been recorded inside the Southwestern United States are "drifters" from Northern Mexico that have expanded their range to prey on domestic livestock. This, despite the fact that the last two jaguars taken were within 6 km (3.7 miles) of the Mexico border, is probably untrue. Historical records indicate that the jaguar was widespread throughout Arizona, New Mexico and Texas from the 1820's (Arizona Fish and Game Dept. 1983). This would predate the arrival of domestic livestock in these areas thus invalidating the current theory. Moreover, if the rate of decline was due to intermittent incursions, the rate of decline would be of a more erratic nature; the rate is instead one of steady decline.

It is believed that the jaguar is able to maintain breeding populations at extremely low densities over large areas much like the cougar (*Felis concolor*). Kill data thus indicates that the jaguar was eliminated from the Southwest by control measures concurrent with the settlement of man and the development of the livestock industry. The Arizona Game and Fish Dept., in its records (1983), summarized in its study that ten of the jaguars were taken by livestock operators and personnel active in predator control (Brown 1983). Fossils found in Florida (audobon) show that the jaguar once lived there as recently as one hundred years ago; therefore, the westward expansion of man and his activities is the actual cause of the demise of the jaguar in the United States.

Similar problems have occurred in Central America. While conducting a study at the Acurizal Ranch in Brazil (1980), Drs. Schaller and Crawshaw had two of their study animals shot by ranch hands which prematurely ended ongoing research. This is a result of an unwritten policy of shooting the jaguar on sight by ranchers and farmers in response to jaguar predation on domestic livestock. Forcing the jaguar back with the expansion of cultivated land utilizing the slash and burn technique could prove to be a problem, as it is believed that the jaguar's population is on the rise and expanding its range towards the United States. (Capstick, 1981).



## Habitat

In habitat selection, the jaguar's requirements are dense cover, a water supply, and sufficient prey (Mondolfi and Hoogesteijn 1982). It would appear then that the jaguar resembles the tiger (*Panthera tigris*) in its habitat requirements and would reflect another correlation to a solitary cat. In the Southwest the jaguar was typically found in the roughest and densest terrain available: specifically a Madrean evergreen-woodland, shrub-invaded semi-arid grasslands, and river bottoms (Brown 1983). In Florida the favored habitat was typically dense swamp (audobon). In Venezuela the jaguar has been found in a variety of habitats. In the southern part of the western llanos (in the States of Apure, Barinas, and Portuguesa), the jaguar inhabits lowland tropical humid forest and lowland deciduous forest, showing a preference for riverine forest with adjoining grassy plains (flooded savanna, swampy savanna, and marsh land).

It has a special liking for water courses, lagoons, and swamps. In the forests bordering rivers and "canos" (slow moving streams), some of which dry up during the dry season, the jaguar finds shelter in the very dense, almost impenetrable understory formed by tangled tree roots, low spiny palms and other plants. In the southern part of the eastern llanos on the coast of the Orinoco River, the jaguar is found in small riverine forest habitats. At El Socorro, near El Baul, in the southern part of the State of Cojedes, the habitat is swampy palm savanna with some densely forested islands, and rocky wooded hills with mountain creeks. Jaguars use some of the caves on the rocky outcrops as dens (Mondolfi and Hoogesteijn, 1982).

Schaller and Crawshaw conducted both of their studies (1978-1980) on the Acurizal Ranch in the Mato Grosso State of Brazil. The ranch, which is located along the western edge of the Patanal, a vast plain that is flooded partially on a seasonal basis by the Paraguai River and its tributaries, is 136 sq km (52.5 miles) in size. Overlooking the ranch is a high ridge covered on its upper slopes by a open type of woodland continuing to the lower slopes and a base that is covered by a mosaic of cattle pastures, thickets, and stands of semideciduous forest with trees that range to 20 m (66 ft) in height. Interspaced between the Rio Paraguai and its tributaries is an extensive flood plain whose margins form meadows and gallery forests. This area however, has been mostly inundated since a flood occurred in this region in 1974. This has produced a narrow grassy beach that separates the waterline from the forest edge on the high ground which provides an ideal hunting area for the resident jaguars. The leguminous trees in the area tend to shed their leaves so that by August they are bare leaving grass as the main cover with occasional bamboo thickets. However, in each valley, drainage is facilitated by a perennial stream bordered by evergreen forest with trees of up to 25 m (82 ft) providing a cool moist gallery forest. This provides cover for wildlife when the surrounding cerrado becomes hot and dry.

*Next month we continue William Baker's **Biology Of The Jaguar** covering: Behavior, Feeding Ecology, Reproduction, and Specimens in Captivity.*

# Legislative Update

Compiled by Georgann Johnston  
Legislative Advisor  
Sacramento, CA



## Right Whales Subjects to Protective Measures in North Atlantic

The northern right whale (*Eubalaena glacialis*) is the most endangered large whale species on earth. Populations reside primarily in the western portion of the North Atlantic, off the coast of the United States, and have been in serious decline in recent years. A study undertaken by the Right Whale Recovery Team concluded that the low numbers of this species, and the apparently low population growth rates, stand in alarming contrast to other right whale populations in the southern hemisphere, as well as other large whale populations worldwide.

In the North Atlantic, at least two populations of right whales, an eastern and a western population, occur, or have occurred, in the past. The eastern North Atlantic population may be nearly extinct. Between 1935 and 1985, there were only 21 possible sightings, totaling 45 individuals, and one researcher considered only five of these sightings (seven individual whales) to be confirmed. The minimum population for the western North Atlantic population (based on known photo-identified individuals) was estimated to be 295 animals.

In the past year, scientists studying the populations have been able to confirm nine right whale mortalities. Two known mortalities occurred in 1995 in middle and late summer along the coastlines of Rhode Island and Canada. Seven more mortalities were documented in the first three months of 1996. The most recent known right whale mortality occurred near Cape Cod, Massachusetts, in May 1996.

Right whales exhibit some behaviors different from most other whale species. These include resting at the surface, surface skim feeding, and surface courtship activity. Additionally, these whales have a slow swimming speed relative to other large whales, making the right whale particularly susceptible to close approaches and disturbances by humans. The U.S. Department of Commerce, through the National Marine Fisheries Service (NMFS) and the National Oceanic and Atmospheric Administration (NOAA) has determined that vessel interactions are the single most serious threat to the safety and continued existence of this species in this area of the world.

The NMFS has developed a proposal to prohibit anyone, whether by vessel, aircraft, or otherwise, from approaching within 500 yards (460 m) of any right



whale found in the North Atlantic. Comments on this proposed rule, along with a more complete outline of the exact rules and regulations under consideration, may be obtained from the Marine Mammal Division, Office of Protected Resources, NMS, 1315 West Highway, Silver Spring, MD 20910. Comments on the proposed rule must be received by 5 November 1996.

*Source: Federal Register Online, 7 August 1996, vol. 61, #153, amending 50 Code of Federal Regulations Parts 217 and 222.*

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## **Migratory Bird Treaty Amendments Seek Senate Ratification**

In late August, President Clinton submitted amendments to the U.S.-Canada Migratory Bird Convention for ratification, as is required by the U.S. Constitution. The amendments deal with the regulation of waterfowl harvests by Alaskan natives and Canadian Aboriginal people. The only birds affected are those which migrate between the two countries.

Previously, the treaty barred migratory bird hunting between March and September. Native people objected to this provision because it failed to recognize the traditional harvests of birds during spring and summer months. Despite the fact that the treaty was originally executed in 1916, the mid-year harvests have gone on unabated. Based on this fact, the U.S. Fish and Wildlife Service does not anticipate that the amendments allowing for additional harvest periods will influence the overall bird populations.

In exchange for the amendments, the United States, Canada and Aboriginal and indigenous people have all agreed to increase the rate of data collection, expanding the scientific base for migratory bird management. In fact, the USFWS just released the results from its summer waterfowl and habitat survey which shows that the number of young ducks produced this year is 25 percent above last year. The Service is estimating that approximately 90 million ducks and other migrating waterfowl will fly south, many coming from Canada and Alaska. This is compared to an estimated migration of 56 million in the late 1980s.

*Source: U.S. Fish and Wildlife Service News Releases, 20 August 1996 and 30 August 1996*

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## **House Votes Away "Dolphin-Safe" Law; Future in Senate Uncertain**

Approximately six years ago, the U.S. Congress banned imported tuna caught by methods that kill dolphins. This summer, the House voted to approve HR 2823, misleadingly named the International Dolphin Conservation Program Act, which lifts the embargo on tuna caught with dolphin deadly fishing techniques.

The original law required tuna fishers to use methods such as artificial lures to catch tuna and earn the "dolphin safe" label. Prohibited was the method of encircling dolphin to catch the tuna which school underneath them.

Alternatively, the new legislation also allows for the use of drag nets, which drown dolphin caught along with the tuna.

The matter now proceeds to the Senate where certain pro-environmental representatives including Senators Boxer (D-CA) and Biden (D-DE) have vowed a filibuster when the matter comes to the Senate floor.

*Source: Sierra Club Action Alert #255, 5 August 1996; The Green Disk; Paperless Environmental Journal June-July 1996, vol. 5, #1.*

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## **Ivory Traders Change Their Name**

Four countries in Africa — Botswana, Malawi, Namibia and Zimbabwe — have been engaged in an ivory trading cartel known as the Southern African Centre for Ivory Marketing. In July of this year, SACIM decided to change its name to the Southern African Convention for Wildlife Management.

The group, via a press release, stated that “a legal and controlled trade in ivory is essential to the future of both the elephant and more general wildlife conservation in our countries, but have come to the conclusion that the Centre’s focus on ivory is now too narrow.” The group further indicated that it may submit a proposal to the next general meeting of CITES, set for June 1997, to downlist the African elephant to Appendix II so that controlled trade would be allowed.

*Source: African Wildlife Update, published by African Wildlife News Service, Aug. 1996, vol. 5, #4*

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## **Barton Springs Salamander Withdrawn as Proposed Endangered Species**

The U. S. Fish and Wildlife Service has issued a proposal to withdraw the February 1994 proposed rule to list the Barton Springs salamander (*Eurycea sosorum*) as an endangered species under the Endangered Species Act of 1973, as amended. The USFWS has issued findings that, based on information now available there is no longer a basis to list this species as endangered.

The salamander is found primarily within the state of Texas and in the past two years, various agencies of the State of Texas have committed to expedite developing and implementing conservation measures needed for the species and the Barton Springs segment of the Edwards Aquifer supporting its spring habitat. An Agreement entered into between the State of Texas and the USFWS addresses risks to the survival and recovery of the Barton Springs salamander through a combination of measures. These measures primarily involve regulations protecting water quality and prevention of degradation of surface and springhead habitat.

A final decision regarding the rescission of the proposal regarding the status of



the salamander will be made later this year. For more information, contact Steve Helfert, Field Supervisor, Ecological Services Field Office, U.S. Fish and Wildlife Service, 10711 Burnet Road, Suite 200, Austin, Texas 78758, (512) 490-0057.

*Source: U.S. Fish and Wildlife News Release 4 September 1996*

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## **Postage Stamps Supporting Animal Interests**

On 2 October 1996, the U.S. Postal Service issued a series of 32 cent postage stamps depicting a number of American endangered animal species. The stamps are in full color and, based on preview copies viewed on the World Wide Web, appear to be photo-quality depictions of the animals in question. The Web site is found at <http://www.usps.gov/images/stamps/96/species.ipg>.

The stamps will include the black-footed ferret, thick-billed parrot, monk seal, American crocodile, ocelot, San Francisco garter snake, Florida panther, manatee, piping plover, gila trout, and the California condor among others. The original release will take place in San Diego, California, but the stamps should be available at all post offices within ten days of the release date

The Postal Service is also considering issuing a 32-cent stamp depicting a puppy and kitten over the legend "Spay/Neuter-Save Lives". Most stamp design decisions are heavily influenced by citizen input, so if spreading the spay/neuter message appeals to you, send a postcard urging creation of the stamp. Cards may be addressed to Citizen Stamp Advisory Committee, Attn.: James C. Tolbert, Manager, Stamp Management, U.S. Postal Service, 475 L'Enfant Plaza SW, Washington, DC 20260-2435

*Source: U.S. Postal Service Web site; National Humane Education Society Bulletin July 1996.*

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## **Keeper Alert...**

**KEEPER EXCHANGE PROGRAM:** The Workforce Innovation Committee for the Los Angeles City Zoo has proposed that a keeper exchange program be considered for implementation in 1997. The committee is requesting all zoo and/or keepers interested in participating in an exchange program to contact:

**Workforce Innovation Committee  
Attn: Richard Floyd  
Los Angeles City Zoo  
5333 Zoo Drive  
Los Angeles, CA 90027**

# Hand-rearing Scarlet Ibis At Moody Gardens

By Jim Dobberstine, Animal Keeper 1 and  
Pat Sharkey, Curator  
Moody Gardens, Galveston, TX

Scarlet ibis (*Eudocimus ruber*) are an attractive exhibit animal, and are found frequently in zoos and aviaries. Their bright color and active nature make them a sure crowd pleaser. In the wild, scarlet ibis are distributed primarily through South America, but overlap geographically with the white ibis (*E. albus*), and are considered by many researchers to be colormorphs of the same species (Aguilera, 1993). Nesting is almost always colonial, typically on mangrove islands (also in willow and other plants), in brackish coastal lagoons and seasonal freshwater wetlands (Bildstein, 1990; Kumerloeve, 1984). During the breeding season, white ibises "raising nestlings feed almost exclusively on freshwater prey, even when this entails flying long distances inland to secure it" (Bildstein, et.al., 1990).

Through 1995, Moody Gardens housed eight scarlet ibis in a large, mixed species rain forest exhibit containing birds, fish, and butterflies. In 1995, two pairs of ibis nested, each producing two eggs. The first egg pipped 11 July, and had emerged from the egg by 12 July. By 14 July, three of the four chicks had emerged. The birds had nested in a Bougainvillea vine, which is very thick and bramble-like. This plant provides a good scaffold for nest building, but also made for several routes of entry for fire ants (*Solenopsis sp.*). On 15 July, we found the fourth chick partially emerged, but completely covered in fire ants. The chick was pulled from the nest, and the ants removed, but it died shortly after. The decision was made to pull the three remaining chicks to be hand-raised.

Our hand-rearing diet was based on one author's previous experience raising ibis, but modified to make use of food items easily at our disposal. We tube-fed a blended mix in the following ratio:

500ml (17 oz.) Mazuri® Flamingo Maintenance  
450g (16 oz.) smelt fillets  
500mg (.02 oz.) B-1  
250mg (.01 oz.) calcium

A large batch was blended to a creamy consistency, and divided up into 59ml condiment containers, which were subsequently frozen and could be individually thawed for feeding. The birds were tube-fed every three hours beginning at 0730 hrs and ending at 2230 hrs. All three chicks had very strong feeding responses. Each chick was fed approximately 10% by mass of its body weight. The first weight in the morning was used to establish the base weight for the growth curve, and to establish the approximate amount to be fed throughout



the day. Each chick was weighed before and after each feeding and was given a small volume of water at each feeding.

Initially we brooded the birds in a 51cm x 25.5cm x 30.5cm (20in x 10in x 12in) glass brooder (converted aquarium). The brooder was placed on a heating pad, which maintained the temperature at roughly 29.5° C (85° F). The bottom was covered with towels, and then small sticks were added, giving the birds something to grasp. This helped ensure proper development, and prevent splayed legs or strained tendons. The birds immediately began attempting to defecate outside of the "nest", consistently defecating at the perimeter of the brooder. By 12 days of age the chicks were very strong walkers, and usually were running to the side of the brooder when they were going to be fed. This is consistent with behavioral data gathered on developing white ibis (De Santo, et. al., 1990). By 17 days of age, it became impossible to simply put them on a scale and expect them to stay put. We addressed this by lining the bottom of a five-gallon bucket with 1.25sq.cm plastic screening, and weighing them in the bucket.



**The three scarlet ibis chicks born at Moody Gardens get weighed in. It wasn't long before they wouldn't hold still to be weighed and had to be placed inside a five-gallon bucket for this procedure. (Photo provided by the author)**

As each chick attained 200g (7 oz.) we began to offer whole, small IQF smelt as 50% of their diet. At 36 days, the oldest chick began to eat the fish entirely on his own, and by 44 days was refusing to be tube-fed at all. By 29 August (approximately 48 days of age), we began placing 250 ml (8.5 oz.) of soaked Flamingo Maintenance and roughly 10% of their combined body weight in smelt in the brooder box for them to feed on as a group, as all three were now eating on their own. This was done on the same schedule as the tube-feeding, and the leftover from each meal was weighed to help determine what was being eaten.

The chicks were still being weighed each morning. Initially, they ate the flamingo pellets well, but seemed to lose interest in them during the second week of offering them. By the third week, interest in the pellets picked up again, and by 15 September (approximately 65 days of age), we had weaned them onto the Flamingo Maintenance as a staple, offering the fish as a supplement.

By 29 July, the chicks had become too large and messy to keep in the glass brooder, and were moved into a 1.25m x 2.5m (4.1ft. x 8.2ft.) plywood box that was 61cm (2ft.) high and screened on the bottom with the same plastic screen described earlier. The box was screened on the top as well, sloping from 1.8m (5.9ft.) at the front to flush with back of the box (61cm/2ft.) which would allow us to perch the box a little higher when the chicks were older. They were housed here until 80 days, when they were moved to an outdoor, 6m x 6m (approx. 20ft. x 20ft.) grass pen.

We have not encountered any life-threatening problems with the health of the birds. At about 16 to 18 days, we noticed that Chick 1 had developed a slight mismatch at the end of its bill. We think this occurred from "pecking" the side of the aquarium brooder box in anticipation of being fed, as it was the only one of the three to exhibit that behavior. They were subsequently moved to the larger plywood brooder box. The condition never worsened as the bill elongated with age. To this day, it still has a very slight mismatch, but it does not seem to inhibit feeding.

Chick 2 developed a problem with its left eye. The eye became completely clouded (cataracts) at about 17 days of age. We are unsure if this is a result of a fire ant sting, being pecked by another chick, or some other traumatic injury. The chick remains unable to see out of that eye, but it does not appear to be inhibiting the animal's feeding or social behavior.

Previous experience indicates that our chicks did not grow as quickly, or to as great a weight as expected. This is illustrated by growth curves for our chicks (Fig. 1) and the actual weights listed in Table 1. At 10 days of age our largest chick weighed only 105g (3.7 oz.), and the group averaged only 85.6g (3 oz.). At 20 days the oldest weighed only 236g (8.3 oz.), and the average was only 172g (6 oz.). The weights for the largest chick are roughly 100g (3.5 oz.) and 250g (8.8 oz.) less than the respective weights at 10 and 20 days for hand-reared white ibises, which were fed every two hours (De Santo, et. al., 1990). This indicates that either the consistency of the diet, or more likely, the number and amount of feedings were not optimum.

It is also evident that there was sizable difference in weight between the oldest chick and the younger chicks. As indicated by Table 1, Chick 1 and Chick 2 are alpha and beta chicks from nest A, respectively. Chick 3 is the alpha chick from nest B. The weights of chicks 2 and 3 are similar, and much less than Chick 1. We think the difference in weight is probably the result of chick 1 having been parent-fed for the first three days, whereas chicks 2 and 3 were pulled and started hand-feeding almost immediately after hatching. As indicated by Table 1, Chick 1 had achieved a weight of 75g (2.65 oz) at 4 days, whereas chicks 2



TABLE 1: Actual Ibis weights

AGE IN DAYS	IBIS #1		IBIS #2		IBIS #3		AVERAGE WEIGHT (g)
	WEIGHT (g)	WEIGHT CHG (g)	WEIGHT (g)	WEIGHT CHG (g)	WEIGHT (g)	WEIGHT CHG (g)	
1			30		31		30.5
2			31	1	32	1	31.5
3			34	3	35	3	34.5
4			40	6	40	5	51.6
5	75		46	6	43	3	53
6	70	-5	53	7	51	8	58.3
7	77	6	57	4	56	5	63.3
8	86	9	63	6	61	5	70
9	96	10	72	9	65	4	77.6
10	105	11	81	9	71	6	85.6
11	115	10	92	11	79	8	95.3
12	125	10	97	5	85	6	102.3
13	134	9	102	5	94	9	110
14	148	14	107	5	98	4	117.6
15	161	13	126	19	108	10	131.6
16	176	15	124	-2	113	5	137.6
17	192	16	138	14	123	10	151
18	211	19	142	4	126	3	159.6
19	216	5	146	4	131	5	164.3
20	236	20	147	1	133	2	172
21	245	9	152	6	135	2	177.6
22	262	17	160	7	144	9	188.6
23	273	11	160	0	143	-1	192
24	288	15	172	12	150	7	203.3
25	308	20	180	8	158	8	215.3
26	342	34	191	11	167	9	233.3
27	331	-11	202	11	181	14	238
28	345	14	215	13	192	11	250.6
29	369	24	225	10	199	7	264.3
30	395	26	225	0	205	6	275
31	415	20	242	17	213	8	290
32	434	19	255	13	228	15	305.6
33	445	11	262	7	233	5	313.3
34	461	16	273	11	244	11	326
35	486	25	294	21	260	16	346.6
36	493	7	298	4	266	6	352.3
37	513	20	297	-1	265	-1	358.3
38	540	27	317	20	280	15	379
39	550	10	325	8	289	9	388
40	562	12	345	20	301	12	402.6
41	568	6	354	9	329	28	417
42	590	22	380	26	350	21	440
43	595	5	394	14	394	44	461
44	612	17	373	-21	358	-36	447.6
45	621	9	410	37	385	27	472

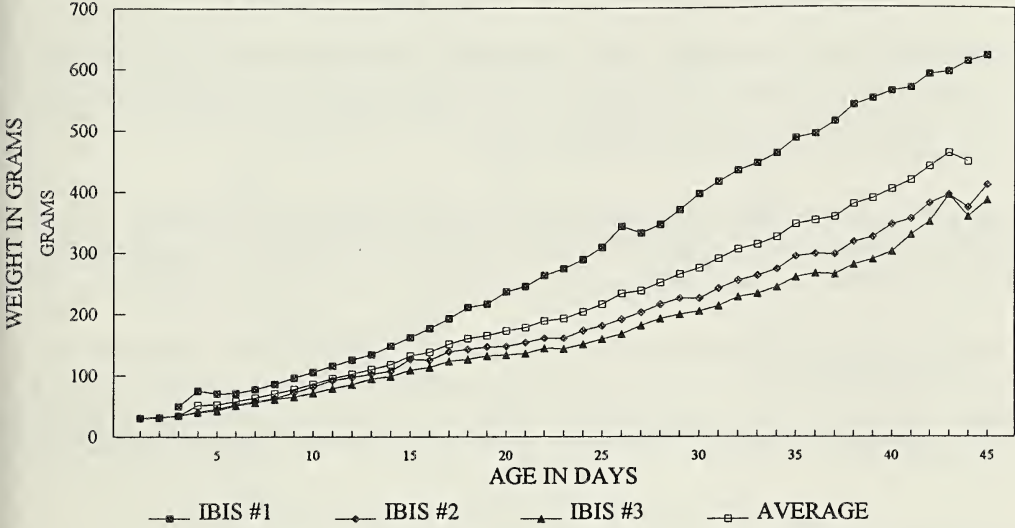
Note:  
 Ibis #1 from nest "A" H:7-11-95  
 Ibis #2 from nest "A" H:7-14-95  
 Ibis #3 from nest "B" H:7-14-95



and 3 weighed only 40g (1.4 oz.) apiece. This early parent feeding may have given chick 1 an initial boost that the other two birds did not get. This is consistent with data gathered for white ibis, which also developed more slowly when hand-raised versus parent-raised (De Santo, et. al., 1990).

At the time of this writing (paper submitted to *AKF* 3/5/96), the ibis are over six months old, and are active and healthy. Should we do any further hand-rearing, we would likely adjust our feeding schedule and /or diet consistency in an effort to increase the overall growth of the chicks, as mentioned above. Hand-raising these ibis has been a thrill for us, as they are some of the first birds to be successfully hand-raised at Moody Gardens since the exhibit opened in 1993. We hope this information is beneficial to others who are interested in hand-rearing ibis.

FIG. #1 - SCARLET IBIS GROWTH CURVES



Acknowledgments

Thank you to everyone on the Moody Gardens animal care staff for their assistance in breeding and hand-rearing, timely observations, and invaluable input.

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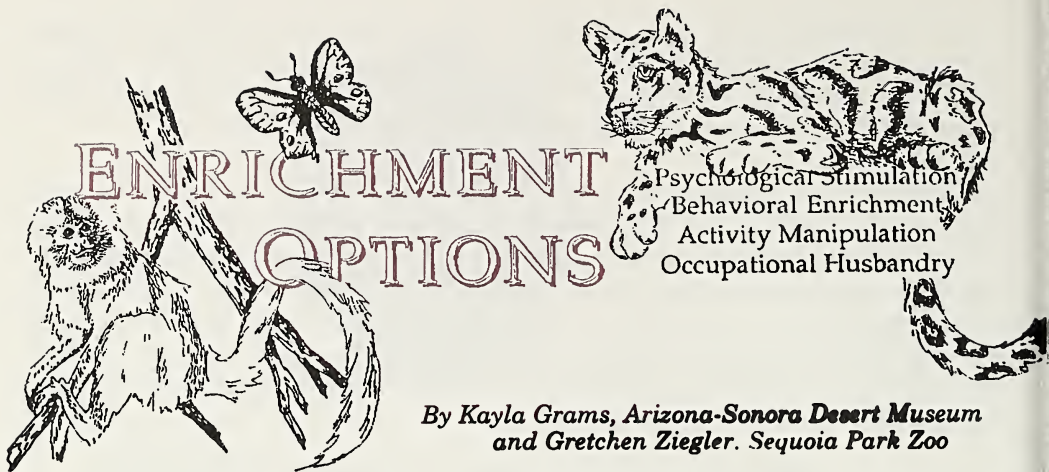
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**RHINOS:** We are currently in the process of hanging sections of cloth fire hose between adjacent pens. This hose can be used as an enrichment itself, or to rub off flies and biting insects. We can spray this cloth with a fly repellent to provide a walk-through repellent applicator as well.

We also use resealable, plastic buckets (without handles) for enrichment. Holes are drilled in various locations on the bucket and the animal must roll the bucket around the pen to dispense the produce pieces of dietary cubes.

We also give cardboard spools (from newspaper) for enrichment. Spools are 24 inches high and 30 inches in diameter. Rhinos enjoy rolling them around, putting their heads through the openings and carrying spools around their pen. If spools appear to get worn, they are promptly removed to prevent ingestion of cardboard.

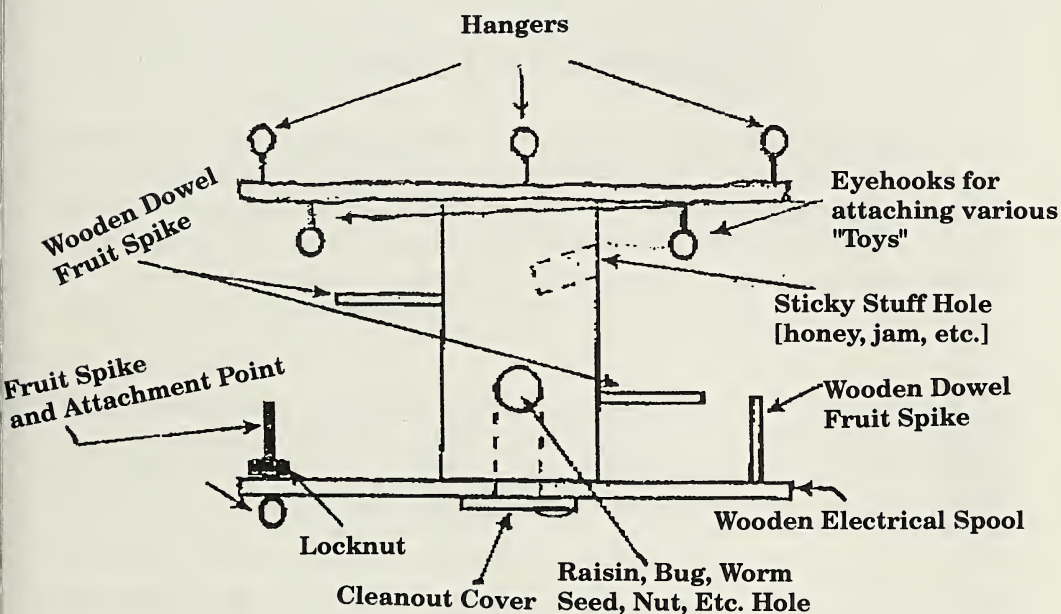
## **HOOFSTOCK:**

1. Using large, eyebolt screws and chains, we secure browse branches, pine trees and/or deadfall in the outdoor yards. Animals have been seen rubbing and scratching themselves on these branches and can eat the browse.
2. We also utilize sections of chain to secure trees and/or branches to the chainlink dividers in their inside holding pens.
3. Branches and trees are also scattered around the indoor and outdoor yards on the ground for enrichment and/or hiding cover for more submissive animals.

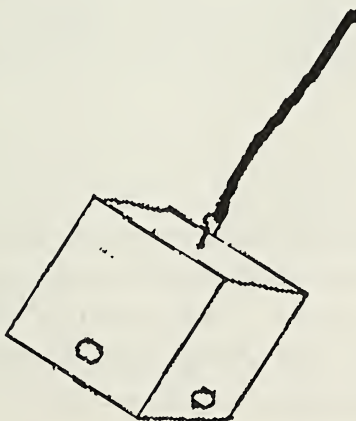
—Wendy L. Shaffstall, *African Plains / Rhinoceros Keeper*  
Kansas City Zoo, Kansas City, MO

**PRIMATES AND BIRDS:** Pictured below is one of the "activity centers" we've made for our squirrel monkeys. The spool has a hollow center which can be filled with seeds, raisins, peanuts, etc., then accessed by animals through 1/2-inch holes drilled into center. Various enrichment items are attached to eyehooks (e.g., keys, hard plastic balls, bells) and changed often to keep it interesting. The clean out cover consists of a circle of wood attached by one screw so it can be swung out of the way easily. The spool can be hung by a chain attached to three points to keep it even, or it can be hung horizontally on a piece of dowel so the animals can spin it.

## ACTIVITY CENTER FOR SMALL PRIMATES AND BIRDS



We also use an 8-inch cubed plywood box with 1-inch holes drilled about 2 inches from the bottom on all four sides. These cubes are filled with alfalfa, then mealworms, seeds, etc. These boxes are also hung from a bungee cord so they can swing, twirl and bounce.





Other enrichment ideas we use with our primates (lemurs, marmosets, tamarins, squirrel monkeys) are pieces of oak branches, 8-12 inches long, with 3/4 inch holes drilled 1 1/2 inches deep. The branches are hung on a bungee cord. The holes in the branches can be filled with a variety of treats including honey, peanut butter, seeds, mealworms, etc.

*-Janice Martin, John Toothill, Valerie Norquay  
Assiniboine Park Zoo, Winnipeg, Manitoba, Canada  
Illustrations by Marc Jackson*

*(Ideas appearing in this column have not necessarily been tested by the editors for safety considerations. Always think ahead and use good judgement when trying new ideas. Eds.)*

## Information Please

I am conducting research on attractions of Marineland of the Pacific (Palos Verdes, CA). Wish to communicate with any past staff, particularly anyone who was an aquarist; designed, worked at, or is familiar with the "Baja Reef" exhibit. Contact Scott Malcolm at 1307 New Haven, Tulsa, OK 74112 or e-mail Happybunny@juno.com. All responses will be kept confidential if desired and will be used for my research in developing a swim-through aquarium project.

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Does anyone know of any successful captive breedings of mangrove monitor (*Varanus indicus*) in the United States? Please send information to: Becky Speer, Caribbean Gardens, 1590 Goodlette Road, Naples, FL 34102 or phone (941) 649-6481 (evenings) or e-mail: cargar@naplesnet.com.

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Has anyone had any experience with epileptic black bears? Would appreciate any information on circumstances, age and sex of animals, treatments used, effectiveness, etc. Please send to: Jennifer A. Verstraete, Head Keeper Mammals and Amphibian/Reptile Museum, Trailside Museums/Zoo, Bear Mountain State Park, Bear Mountain, NY 10911-0427 (914) 786-2701 Ext. 278.

**CORRECTION:** Please note that in the article "Captive Breeding for Macaw Conservation in Costa Rica" (September 1996 *AKF* pgs. 491-493) no photo credit was give. Photo credits should have read "Photos by Mike and Ana Pickerel". We apologize for this inadvertent omission.

# ***Extinct Lions May Be in Ethiopian Zoo***

Experts believe 11 lions found in a forgotten Ethiopian zoo may be related to two African subspecies wiped out by colonists. Ever wondered why the beast roaring out of the screen at the start of every MGM movie doesn't really look like the cats you see in the Kruger National Park? It is because the ferocious lion with a long black mane which features so often in popular iconography is now extinct in Africa.

Or is it? Eleven animals which look remarkably like the magnificent Cape or Barbary lions — subspecies resembling the near-mythical “biblical lion” that is thought to have died out in Africa decades ago — have been “discovered” by a South African researcher at a forgotten zoo in Ethiopia.

Hym Ebedes, specialist wildlife researcher at the Onderstepoort Veterinary Institute, spotted a group of lions with distinctive long, wide black manes that reach under their bellies at a zoo in Addis Ababa during a research expedition into Ethiopia's wilderness areas late last year. The scientist says the male cats in the pride, descendants of a group of lions kept by Emperor Haile Selassie at the royal palace in Addis before he was toppled in a 1974 coup, have the physical features of the North African Barbary lion or South Africa's Cape lion. Both were shot out of existence by white hunters and settlers during the colonial period.

“Over the past 35 years I have seen hundreds of wild lions in game reserves, lots of captive lions in zoos all over the world, as well as photographs of lions in wildlife books from all over southern, western and eastern Africa, but I had never before seen anything so impressive, majestic and magnificent,” Ebedes told the *Mail & Guardian*, a South African newspaper. “The sight of a black-maned lion pacing around his cage just before feeding time in a zoo in Addis Ababa last October had an indescribable spine-chilling effect on me. This animal was exactly as I had always visualised and pictured the Cape lion, which became extinct about 150 years ago.”

Barbary lions from the Atlas Mountain region in present-day Morocco were imported from North Africa into the Roman Empire. They were used in gladiator contests and featured in legendary accounts of Christians being persecuted by the Romans. The last of the North African animals was shot dead in the Atlas region during the 1920s. Their ferocious features and beautiful black manes appear frequently in Greek mythology, biblical literature (the lions of Judea and the animal that Samson killed with the jaw of an ass), popular Western iconography (MGM movies and Simba cartoons), as well as the folklore of many African cultures. The Cape lions, which had a strong resemblance to their North African cousins, were hunted by colonial farmers in the 19th century and were thought to have become extinct in the 1850s.

Cape (*Leo melanochaitus*) and Barbary (*Leo leo leo*) lions — each a subspecies of the same cat family (*Panthera leo*) — probably developed similar features



because cool winter climates and the absence of dense bush on each tip of the continent allowed their manes to grow longer than other types of African lions. A 19th century account describes males of the extinct Cape lion as having "large manes that reach far behind the shoulders; belly mane developed; the yellowish colour of the mane around the face contrasts sharply with the blackish, or pure black colouring of their mane on the neck, shoulders, throat and chest."

There are three male lions, four lionesses and four cubs in the Ethiopian zoo. Mystery surrounds their history and presence in the East African country. It is known that they came from the private collection of Hailie Selassie, whose dynasty called itself the Lions of Ethiopia and always kept the wild cats to help cultivate its image of power. The last of the Selassie families was overthrown in a military coup and was replaced by the Marxist government of Mengistu Haile Mariam in 1974. The lions were transferred to the zoo in Addis Ababa. Ebedes is the first Western veterinary scientist to have visited the zoo since the dictatorship was replaced in the early 1990s by an elected government.

"Given their enthusiasm for collecting lions, it is possible that Selassie obtained the animals from a private collector or a zoo in Europe that had, in turn, acquired them from the Cape or North Africa before these types of lion became extinct," says Ebedes.

Selassie is dead, while Mariam is living in exile in Zimbabwe. Ebedes has consulted Ethiopian historians to see if they know how the lions came to Addis, but these inquiries have drawn a blank. He says the best way to begin unravelling the riddle is to conduct comparative genetic tests on the live Addis animals and the skins of Barbary and Cape lions that exist in European museums.

Petri Viljoen, a biologist who specializes in research into the genetic features of South African lions, says the Ethiopian discovery offers intriguing prospects for breeding and possibly reintroducing into the wild a species that has disappeared from record. But he warns that the excitement in zoological circles is based, so far, only on the physical characteristics of the animals found in Addis. Viljoen says captive lions are known to develop large torsos and long manes because they do not have to hunt in hot and dense bush. This, rather than genetic membership of a subspecies, could explain the physical characteristics of the Ethiopian lions.

Professor Fritz Eloff, renowned for his research into the lions of the Kalahari desert, says he has studied video footage taken by Ebedes of the Ethiopian pride. "I have seen lions from all over Africa, but never such lions. They look exactly like the pictures and sketches of the Cape lion that I have seen."

Eloff says DNA analysis is the only way to determine whether the Ethiopian lions come from the two extinct types of African cats. "The other important question that needs to be answered is, where do the lions come from? Are they Ethiopian lions, or do they come from further north — for example, from Morocco?" Eloff says there are records of lions that resembled the extinct Barbary

lions living at a zoo in Rabat, Morocco, during the 1970s. He agrees that private collectors in Europe may have kept Cape or Barbary lions and then supplied the offspring to the Selassie family.

Vratislav Mazak, a European zoologist and lion specialist, reports that the Cape lion was the first of the African subspecies to become extinct. It died out too soon for scientists to study it properly — making it difficult to compare it to the pride in the Addis zoo. Mazak's scientific reports say there are only eight mounted skins in natural history museums in England, the Netherlands, France and Germany.

Meanwhile, the owners of the Kapama private game reserve in South Africa are negotiating with the Ethiopian government to buy some of the Ethiopian lions and bring them back to this country. Ebedes has suggested the Cape Public Works authorities rehabilitate the historical lion enclosure at the old zoo at the Rhodes Memorial in Cape Town so that it can house these animals which strongly resemble the legendary cats who once roamed freely on the slopes of Table Mountain.

--from the *South African Mail & Guardian*, July 11, 1996



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# Chapter News Notes



## Greater Kansas City Chapter

The Greater Kansas City Chapter of AAZK raised \$5450.00 for our 9th Annual Bowling for Rhinos Fundraiser this year. We had more sponsors than ever and wish to thank them for their support. Our thanks also go out to everyone who helped put it together and to those who participated.

Our Chapter and zoo will be helping send seven keepers to the National AAZK Conference in Detroit. They are all eagerly awaiting the trip!

We are also looking forward to a visit from Anna Merz on October 2. The event will feature a dinner and a presentation by Anna on her work at the Ngare Seroi Rhino Sanctuary.

--Penny L. Cram, Chapter Liaison and  
Jenny Shillcox, Secretary

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## Belize Government Approves Establishment of Wildlife Care Center

The Government of Belize has recently granted approval for the establishment of a wildlife care center for the purpose of rehabilitating confiscated wildlife in preparation for release to a natural habitat. Emphasis will be on the development of remedial training and release techniques; research in Belize's protected areas to determine suitability as release sites; and monitoring of released animals to evaluate viability of release programs. Affiliations with Belizean and foreign universities will provide training opportunities to undergraduate and graduate students in wildlife management and veterinary medicine. Interested persons may obtain further information by contacting: Robin Brockett, c/o Belize Audubon Society, P. O. Box 1001, Belize City, Belize, Central America. Fax: 011-501-02-34985

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## AZA Conference Schedule

AZA Eastern Regional Conference, March 19-22, 1997 - Memphis, TN. For further information, contact Carol Cratin, Memphis Zoo, 2000 Galloway Ave., Memphis, TN 38112 (901) 725-3450.

AZA Western Regional Conference, April 9-12, 1997 - Phoenix, AZ. For further information, contact Bruce Bohmke, The Phoenix Zoo, 455 North Calvin Parkway, Phoenix, AZ 85008 (602) 273-1341.

AZA Central Regional Conference, May 15-18, 1997 - Cleveland, OH. For further information contact Jim English, Cleveland Metroparks Zoo, 3900 Brookside Park Dr., Cleveland, OH 44109 (219) 661-6500.

*Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks/AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing date for positions available and when setting these dates keep in mind that because of bulk-mail, most readers do not receive the AKF until the middle of the month or later. There is no charge for this service and phone-in or fax listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is (913) 273-1980.*

**CHIMPANZEE CAREGIVER**...one full-time position open. Requires two years of college level course work, two years experience in the care of exotic animals; OR an equivalent combination of experience which provides the required knowledge, skills and ability. Primate experience a plus. Assist in the responsibility of caring for approximately 80 chimpanzees (*Pan troglodytes*) in a breeding colony. Must be willing to make at least a two-year commitment. Excellent benefits. EOE. Applicant must have a negative TB skin test, negative hepatitis B surface antigen test, and evidence of a measles booster or natural disease prior to employment. Send letter of interest (with requested salary), resumé and three letters of reference to: Jo Fritz, Director, Primate Foundation of Arizona, P.O. Box 20027, Mesa, AZ 85277-0027. Position open until filled.

**ANIMAL KEEPER/ELEPHANTS**...a full-time position is being offered at the Metro Washington Park Zoo, Portland, OR. Annual starting salary range is \$29,336.40 - \$34,159.68 after one year. Excellent benefits including retirement, medical, dental, vision, life and long-term disability. The successful candidate is likely to have at least two years experience at an accredited AZA institution where they excelled as an elephant keeper in protected and free contact as well as all facets of animal keeping including enrichment and training, visitor interaction, and communication. Application materials, position description, and deadline date are available from the Metro Personnel Office located at 600 NE Grand Ave., Portland, OR 97232 (503) 797-1570. **Resumés not accepted.** EOE.

**BIRD KEEPER**...The Department of Natural and Environmental Resources of Puerto Rico is accepting resumés for an opening at its captive propagation facilities for an endangered Amazon parrot. The applicant must have excellent knowledge of the requirements, general biology and behavior of psittacine birds, especially Amazons. A degree in animal science/biology/zoology or related field, with two year's paid experience preferred. Primary responsibility will be the day to day care and feeding of the parrot flocks. This includes food acquisition, storage, preparation, and twice daily feeding and cage maintenance, cleaning and disinfection. General facilities maintenance is also included, such as painting, carpentry work, cleaning, vehicle maintenance, minor repair work, troubleshooting and grounds-keeping duties. Additional duties may include active participation in flock physical evaluations, blood collection, parrot handling and restraining, neonate feeding and care and accurate recording. Applicant must be able to assist the project leader, veterinary assistant and other staff personnel as a team player, and be flexible, creative, organized and demonstrate a good attitude. Salary is commensurate with experience, up to \$12,000.00 a year, and includes a two-bedroom residence, water and electricity. Applicant must live on site. Position open until filled. Send cover letter, resumé and CV to: Project Leader, P.O. Box 439, Arecibo PR 00613-0439.

**NIGHT ZOOKEEPER**..requires a high school diploma and one year paid experience in a zoological park or related field. Four-year degree in a biological field preferred. Duties will include all aspects of animal care and husbandry, routine exhibit maintenance and grounds security. Will be cross-trained and work with over 100 species. Must be able to lift 50 lbs. Three positions available with two shifts: 4:30 p.m. - 12:30 a.m. and 12:30 a.m. - 8:30 a.m. Benefits include six (6) paid holidays, health and life insurance, vacation, personal time and uniforms. **Must have position filled by 1 November 1996.** Please send resumé/references to: Brevard Zoo, Attn: Shawn Heflick, 8225 N. Wickham Rd., Melbourne, FL 32940. Resumés/references may be faxed to: (407) 259-5966.



**ANIMAL TRAINER**...requires previous experience in animal care and behavioral training and in presenting shows to various size audiences. This is a full-time, year-round position as part of a three-person animal training team. Loon Mountain's Wildlife Theater is a new and growing program focused on education and entertainment with the use of trained animals, primarily the native wildlife of New Hampshire. Our collection currently includes cougars, small mammals, raptors, parrots and snakes. Loon Mountain Recreation Corporation is a year-round resort that offers downhill and cross-country skiing, hiking, horseback riding, archery, in-line skating, mountain biking, scenic gondola rides and other family entertainment. Loon Mountain is located in the town of Lincoln, in the heart of the White Mountain National Forest. Please send resumé by **31 October 1996** to: Ruth Berkeley, Human Resources Manager, Loon Mountain Recreation Corporation, RR 1, Box 41, Kancamagus Highway, Lincoln, NH 03251-9711 or fax to (603) 745-6087. For more information call (603) 745-6281 ext. 5581.

**ZOOLOGICAL CURATOR**...for the Hong Kong Zoological and Botanical Gardens. Required to undertake curatorial duties of the Kong Kong Urban Council's zoological collections including aspects on animal welfare, zoo-design, husbandry and breeding, exhibit-sourcing, training zoo keepers and assisting in veterinary work. Must have a degree in zoology or related natural science plus at least seven (7) years practical experience in managing a zoological collection. Additional appropriate veterinary qualifications, zoo/wildlife veterinary experience, Membership in the Royal College of Veterinary Surgeons (MRCVS) or eligibility for MRCVS an advantage. Salary commensurate with experience and ranged from HK\$42,320.00 to HK\$65,120.00 per month, with an excellent benefits package. Successful candidate will be offered a 2 1/2 year contract which is renewable subject to service needs and performance. Please send application with resumé and photocopy of documentary proof of qualifications by **4 November 1996** to: Executive Officer (LP), Leisure Services Division, Urban Services Department, 42/F., Queensway Government Offices, 66 Queensway, Hong Kong, or fax to **011-852-2868-5062**.

**VETERINARY TECHNICIAN/HOSPITAL KEEPER**...The Gladys Porter Zoo is seeking qualified applicants for a full-time veterinary technician/hospital keeper position. Job responsibilities include, but are not limited to: weekend and relief hospital/Children's Zoo keeper duties (cleaning pathology, assisting with all procedures, radiology, etc.), MedARKS data entry and maintenance of medical records. Prior technician experience and working knowledge of MedARKS preferred. Wage in the mid-teens, plus benefits. Send resumé to: Teri Herman, RVT, Gladys Porter Zoo, 500 Ringgold St., Brownsville, TX 78520.

**ANIMAL KEEPER**...prefer four-year college degree in life science or zookeeping degree, and one year experience in similar work. Position involves all aspects of captive animal care. Seeking person with high level of experience and/or interest in African Plains animals, specifically, mixed-species hoofstock exhibits, carnivores, and/or primates. Must be a professional, motivated team player who can work independently, also willing to take part in public demonstrations/education and media sessions. Excellent observation, record keeping, writing, and communication skills helpful. Computer knowledge a plus. Excellent benefits and work environment. Send cover letter and resumé to: Mary Jane Bennett, Director of Human Resources, Indianapolis Zoo, 1200 West Washington St., Indianapolis, IN 46222. EOE.

**ZOOKEEPER**...full-time position with benefits. Requires one (1) year paid exotic animal experience, high school diploma (college degree preferred). Will initially rotate to all areas of the zoo. Possession of a valid motor vehicle license required. Send resumé to: M. McBirney, Curator, Pueblo Zoo, 3455 Nuckolls Ave., Pueblo, CO 81005 by **1 November 1996**.

**AAZK Membership Application** *check here if renewal [    ]*

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# ANIMAL KEEPERS' FORUM



**The Journal of the American  
Association of Zoo Keepers, Inc.**

**NOVEMBER 1996**



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**Incubation Notebook Project** - Scott Tidmus, Sedgewick County Zoo, Wichita, KS



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## **About the Cover.....**

*This month's cover features the North American River Otter (*Lontra canadensis*), one of several species of otters found on almost every continent. It was drawn by Mary Deckert, a Docent at the Los Angeles Zoo. Otters belong to the family Mustelidae and live principally in water, although they can move swiftly on dry ground as well as in the water. Otters may weigh between 11-30 pounds depending on species, have short legs and five webbed toes on their feet which make them excellent swimmers. Their fur is heavy and waterproof to protect them against the cold water of their winter habitats. They average 35-50 inches in length, including from 12 to 20 inches for the tail. Fish is their main diet, although they will also eat water rats, frogs, and small birds. The young (usually 3-4 in a litter) are born throughout the year after a gestation period of nine weeks. Thanks, Mary!*

## **Information for Contributors**

*Animal Keepers' Forum* publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Articles may be submitted on disk by arrangement with the Editor. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy finish black and white photos **only are accepted**. Color slides should be converted to black and white prints (minimum size 3" x 5" [8cm x 14cm] ) before submission. Clearly marked captions should accompany photos. Please list photo credit on back of photo.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for *AKF*. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

**Deadline for each regular issue is the 10th of the preceding month. Dedicated issues may have separate deadline dates and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the *AKF* staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$3.00 each.

## ***A Message from the Executive Director.....***

In the months leading up to the National AAZK Conference held in Detroit, I have been seriously analyzing the finances of the Association in order to start master planning for the future. Historically, operating funds have come from two sources - the membership dollar and in an effort to keep membership costs affordable, profits from publications. Until recently this financial plan allowed us to cover expenses and make limited plans for the future. Inflation has dramatically altered this strategy.

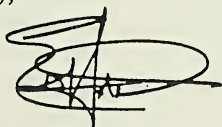
In an effort to simply cover rising expenses associated with operating this organization, I have recommended to the Board of Directors an immediate increase in the membership dues of \$5.00. This is the first membership fee increase since 1989 for members residing in the U.S. and is effective immediately for the categories of Professional, Affiliate and Associate. Membership fees in other categories will be adjusted as well. Financial support of the Association must also shift from publications to the chapters.

On 1 January 1997, Chapter Recharter fees will rise \$50.00 in each category, with another planned increase of \$25.00 in 1998. A review of the 70-plus Chapters and their finances in 1996, shows the total net worth of Chapters to be over \$220,000.00. The current assets of the corporation headquarters is around \$16,000.00 or roughly 7% of the total Association. Please note, that in 1996, AAZK Chapters donated over \$165,000.00 in the name of conservation, supporting many fine programs worldwide. AAZK, Inc. received less than \$3200.00 in donations from our Chapters.

The Board of Directors has called for financial cutbacks in our operations budget in 1997. Officer and committee budgets have been cut significantly and Association travel will be reduced dramatically. Part-time staff has been cut back and wages have been frozen until further notice.

During the next six months, the Board of Directors will be drafting a visionary statement to chart the growth of the Association into the year 2000, including the initiation of a development fund. As always, if you wish for more detailed information on the finances of AAZK, Inc., or on the Association in general, please do not hesitate to contact me through the Administrative Offices.

Respectively,



Ed Hansen, Executive Director AAZK, Inc.





## Animal Behavior Concerns & Solutions

A Question and Answer Forum for the Zoo Professional

By Diana Guerrero

Independent Behavior Consultant, Ark Animals of California, San Diego, CA

### Nursery Behavior Necessities

#### Zoo, Nursery & Children's Zoo String: Pachyderms

##### QUESTION

There have been numerous problems associated with hand-reared babies in zoological gardens. These include not only human orientation or imprinting but higher instances of aggression to keeper staff, animal ambassadors going awry, and difficulties in integration with others of the same species. Can you address this topic?

**NOTE:** Since this is a very complex topic, the next several columns will deal with this issue. If you have specific tips or questions please direct them to AAZK or e-mail ARK direct at [arkabc@ix.netcom.com](mailto:arkabc@ix.netcom.com) for inclusion in this series. Due to the length of the answers, ambassador animals will be addressed as a collective article later.

##### BACKGROUND

Please see *Animal Keepers' Forum*, Volume 23, No. 10, 1996

##### PROBLEM

Please see *Animal Keepers' Forum*, Volume 23, No. 10, 1996

Problems are also escalated when you are raising any animal due to the lack of data on behavioral development. Humans and domestic species of animals have specific development and critical learning periods which, if not utilized correctly; or if they are not exposed to those particular experiences that must be secured during that time, will result in abnormal development or dysfunction.

Many animals are more open and receptive to behavioral conditioning at weaning age. Most animals need to be handled appropriately before then. Babies are very malleable and behavior strategies, if clear, may be easily ingrained despite the genetic or instinctive behavior characteristics. When you get into the larger species of animals that take longer to wean, things become more complicated.

Another problem to consider is whether or not human-reared animals are to be considered a success or not. Mother-reared neonates are the ideal since they show success in captive management on many levels. Social skills found in mother-reared infants are many times lacking in hand-reared infants. In some

species hand-rearing creates “dysfunctional” individuals who face various difficulties in integrating with their own species, and other related challenges with interfacing successfully with those animals or with humans as they mature. In worse case scenarios, they will exhibit signs of stereotypic behavior, and sometimes will have physiological challenges due to imbalances. So the question that remains to be answered is: When is hand-rearing to be considered a success?

### **ANIMAL PROFILE: ELEPHANTS**

Captive-raised elephants are a difficult challenge. The babies being born now are being born to captive held animals that have missed the elephant socialization and natural education that comes from living in a herd environment, such as in the wild. Those adults may be considered dysfunctional since they never had education from older elephants (as a general rule) or perhaps grew up completely solitary (without elephants or older elephants) until later in life. In many cases, the mothers or other animals in the herd may have never had exposure to a birth or the events connected with it.

Another challenge in captivity is the frequent change in the herd dynamics and shifting of animals from one location to another. Many bonds that have been broken may add to the instability of some individuals later in life and other variables such as training background, exposure to new stimuli, and other such things can contribute to producing a more unreliable animal. Because of the historic lack of behavioral or training records, this is hard to track.

Other challenges include a lack of proper socialization (compared to the natural history of the species) and exposure to different routines and management techniques, which complicates management of this species. With the current variables concerning captive management (free contact, protected-contact, no contact and confined management) in a constant state of flux, it is important to give any captive offspring the best behavior coaching possible. This means that strategies introduced to the animal at a young age are critical. The birth of a calf is an opportune time to use that occasion as an educational tool not only for the baby, but for the staff, the other herd members, and the mother.

Controlled Contact vs. Uncontrolled Contact are terms I prefer to use with the management of elephants instead of all the current titles given in the industry. You either have control or you do not. There have been injuries and incidents in both “Free Contact” and “Protected Contact” that have occurred due to a lack of behavioral control. Also, in management of the elephants it appears that some animals do better in one system while others do better in another. Safety and a high degree of husbandry care are critical factors for consideration in elephant management but so is reproduction. The zoological industry is going to have to refine elephant management further to address breeding across systems and the related challenges of successful birthing (i.e., having both the mother and offspring survive).

### **REARING CONSIDERATIONS: EXPERIENCED RESOURCES**

Hand-rearing experts are usually found in the nursery of children’s zoo areas.



Training and behavior experts are usually found outside that area. Without any disrespect to either group, since they have very different and critical skills, in this particular species, if the mother is not rearing the calf, it is suggested that elephant calves be left with the particular training personnel of the Elephant Department and around the herd.

Reasons for this vary, but since the behavior control and integration back into the group is critical to producing a stable animal that will weigh around 10,000 pounds, that would be the best for the animal....and the full grown animal's future keepers/trainers.

Facilities might consider placing a hand-rearing person on loan to teach the elephant department some basics of their skill or perhaps rotate them through a short training or practical experience in the nursery while the cow is pregnant.....just in case.

Your best contacts regarding this type of situation are found by following the recommendations of your elephant manager or by contacting the Elephant Manager's Association. There are some facilities with successful breeding and calving programs that would be more than happy to assist. Other sources include independent elephant consultants instead of or in conjunction with behavior consultants. A broad base of experience with elephants and years of experience with the species is critical to the success of this type of strategy development. \*

\*For further information on this topic consult with your facility management for the Elephant Manager's Statement on Free/Protected Contact and the American Zoo & Aquarium Association's Elephant Management Guidelines & Minimum Standards For Management of Elephants in Captivity.

#### **PRACTICAL CONSIDERATIONS: ELEPHANTS** (General Overview)

Although this column usually only covers general behavior recommendations, some of the professionals who discussed this topic felt that it was important to include the following areas for consideration. **Bold** items are included in this article while the others are only listed here but can be found in a brief format, for those who are interested, on the Ark Animals website. Since hand-rearing deals with the animal in a "free contact" system the focus of this article will be from that viewpoint.

PRE-TRAINING MOTHER PRIOR TO CALVING

COMPILATION/ANALYSIS OF FORMULAS

RESTRAINT CONSIDERATIONS FOR CALVING

HERD CONSIDERATIONS SURROUNDING THE BIRTH

## **CALF SPECIFICS**

### **IMMEDIATE INTEGRATION**

### **IMMEDIATE TOUCH TOLERATION**

### **CONSISTENT RULES OR GUIDELINES**

### **NUDGING OR PUSHING**

### **SOCIALIZATION & DESENSITIZATION OR EXPOSURE**

### **LEARNING GUIDELINES & DEVELOPMENT**

### **EARLY TRAINING**

## **CALF SPECIFICS:**

### **IMMEDIATE INTEGRATION**

If the calf is left with the mother this is minor. Introduction to the other cows is the next hurdle. If mother has not accepted it, mom is the first introduction. If she is hostile to the baby, then introduce it to each cow in the herd prioritizing the introductions by tolerance or stability of those animals. The baby should not be left unattended by humans in these interactions or introductions.

### **IMMEDIATE TOUCH TOLERATION**

From the earliest hours, the baby should be desensitized to touch. They will need to learn to tolerate touching all areas of their body - everything. Eyes, ears, mouth, from the tip of the trunk to the end of the tail; from the top of their head and back, to the bottom of their feet. Everyday touch them, massage them. Once they are more coordinated, gently begin to look at their feet and teach them the word for that behavior (foot). Once they mature and begin to notice other things around them, you can teach them the difference of right and left, etc.

### **CONSISTENT RULES OR GUIDELINES**

ALL humans in the department, whether they are cleared on handling the other animals in the herd or not, must be able to handle/control the baby. This teaches the baby at a young age to not disrespect anyone in their sphere. That is why it is important to be selective with who is interacting with the youngster.

Keep the number of people who are working with the calf to a minimal. You do not really need to socialize them or expose them to lots of people early on. They don't need to experience everyone in the world! Your goal is to create a sound little spirit and to do this they need stability. The more humans involved with the baby will allow more opportunity for the youngster to acquire inappropriate/naughty behavior. Have PR and others in to fulfill those commitments but monitor and control those interactions for the welfare of the animal.

Behaviors here can be done slowly and gradually using natural behaviors and "capturing them" while pairing them with a verbal cue. The most important aspects are to respect the human space and not push or rub on a human. Trunk etiquette is also important. Keeper relationships with the animal is extremely important especially within a herd structure.



Slapping or corrections with the hands are not recommended since the hands should be reserved for positive reinforcement and touch. Although a trunk substitute in social situations (and elephants whack each other occasionally) the hands are better used for patting, scratching, and rubbing.

### **NUDGING OR PUSHING**

Anticipating trouble and avoiding setting up situations are good strategies but you must be able to stop this behavior of pushing at a young age. This is highly desirable since they will be less inclined to try it again later once they learn the rules. Using your knee (or elbow?) to give a bit of a "charlie horse" or unpleasant correction on the baby's leg or elsewhere is a better strategy than slapping with your hands.

Young animals should not have a hook used on them. Their behavior can be shaped in fun, short interactions or from play. They need to feel trust and look to you for guidance. Set the rules and stick to them. All the staff must be consistent and the less extraneous interactions with other people, the better. To shape and mold the baby properly, it needs to have clear guidelines, consistent and reliable people, and persistent application of techniques.

### **SOCIALIZATION & DESENSITIZATION OR EXPOSURE**

In working with babies, and specifically with the more complex species, it is always good to look at strategies used with humans. Most human babies will be socialized, taken to new areas, given new toys, talked to, given words to go with new items or activities, and introduced to other living things. If you are going to bring up a well-rounded individual who is stable in most circumstances you will want to do similar things with an animal baby. The most important factor here is that whatever you allow in the nursery will be taken out into the exhibit and into adulthood. A baby of several hundred pounds will become a very large creature of several thousand pounds, and their future keeper or trainer's lives will depend on what you instill early on in the nursery atmosphere.

### **LEARNING GUIDELINES AND DEVELOPMENT**

Babies can begin to grasp some concepts around six weeks. They are all different and these concepts are usually basic ones. When bottles become less frequent and with the introduction of solids, their minds have time for other things. Solids are usually being taken in regularly within six months. While most will wean in captivity at two years, they aren't weaned in Asia until about four years. More structured training can begin at two years, if you have done the early work well and built a good foundation, this should be a snap.

Youngsters really do not have a clue. In the beginning they will look for the bottle then look for you. That is the first association. Use that link to do exercise and baths; hydrotherapy and walking. Later the calf will get curious, and will automatically begin demanding more attention and restrictions. The same rules to deal with these things should be followed by all staff.

Again, the trunk and other body parts need to be manipulated and touched.

The trunk should also be held a lot. And no pushing! Little bulls will take more liberties and you will need to take control sooner. The space around you is sacred, they need to learn to respect it. Slapping is not advised because the hands, again, need to be positive. Sometimes a little crop or twitch can be used to give a little sting, much like tapping a child who is intent on touching a hot stove. Which is better to experience a tap or a burn?

Most youngsters will learn to use their nose right away in some form. Each has their own development schedule and some will take longer to become coordinated. Providing various toys, barrels, balls, wood shavings, etc., will help. Hay, pellets, apples, sweet potatoes, and other foods are okay to introduce as long as they are very finely chopped to prevent choking. These items will be picked up and played with as will small pieces of browse. That's how they learn what to eat if they are with mom, they also begin to explore everything!

Manners are also important to instill in these babies. One facility visited recently was working on "Donor Etiquette" basically it was "take-the-tidbit-nicely-and-don't-slime-the-donor!" When working with babies, or any animal, be clear about the rules and let others know what the rules are. If they aren't allowed to do something, tell the people visiting or interacting beforehand, then take control before the rule is broken. Prevention is always the best strategy.

## **EARLY TRAINING**

If you have taken care of the calf in the proper manner your training program will really already be done! There are other areas to consider implementing depending on where the animal could end up later in life.

Teaching the calf not to bolt or to walk with you in other areas outside the exhibit yard and sphere of familiarity is important. Tolerating restraint and learning to stand still also fall into this category.

To teach the calf not to run and to walk with you can be done with slow introductions, and ropes put quickly on and off in the yard as a first step. Use successive approximation in short little steps. First, teach the baby to accept the rope or ankle bracelet, then get it used to the rope, next teach it that it cannot pull against the rope. A neck rope with loop around a larger cow's neck, and another rope to the baby hooked through that loop, but with slack control from your hands, works well for walking behavior. A tree or anchor in the yard can be used to teach the baby to stay or stand still. Again, small slow steps without force or fear teach the baby quickly and easily.

They must also be introduced to chains and a girth strap. Most babies will need to be introduced slowly to get used to things and have an understanding of what they are. Tethering, straps or mock saddles are some of the other items to introduce and don't forget trailering or crating with the mother (if she is open to it) and then alone (without transport or confinement at first).



Then you teach standing still! (One of the biggest challenges for babies). An ankle bracelet, that they are already accustomed to, can also be tied for a minute and released. One attached on the back legs can have a short rope or chain connected and left hanging. Since it hangs around the back and they step on it, they will teach themselves to stand or be careful around the device in two or three weeks. Then it can be tied for a minute, rewarded, and then released gradually lengthening the time-span of restraint.

The basics should always include the standing still and laying down, using the nose as a guide, and tail-up. Lessons taught can depend on what the animal's future may be and how receptive they are.

You can mold how receptive they are and that really depends on how you handle the baby and the introductions to new things or behaviors. Give and take, and mimicry also work as strategies. The biggest mistake with babies is to let them take too many liberties with people. There are individuals (animals) with predisposition's to certain behaviors which can get worse when they get older. That is why you need to shape and direct the baby from birth.

## **RECORD KEEPING & ETHOGRAMS**

The current population of elephant babies in the United States and in England provides us with unique opportunities to conduct behavioral development studies in captivity. Those records can be extremely important to developmental studies and training success. If your facility currently has a baby and is not engaged in this type of study, it is highly recommended that the research department, local college, or current staff work at documenting this unique opportunity from a behavioral development angle.

## **OTHER**

To properly address all angles of this issue is beyond the scope of this column. The intent here is to stimulate your thinking and to impress upon staff involved in animal care just how important your behavioral observations and notes are. You create the foundation for the future care of those species and individuals entrusted to your care and those of other caretakers.

Socialization with other animals of the same species is critical. The ideal situation would be to place a baby who is not being mother raised into a group who is mother-rearing and herd socializing a baby. This cooperative effort between institutions would be very beneficial, not only to the individual animal, but to the captive population of elephants in general.

There are as many different opinions on this topic as there are individuals dealing with it. One of the most consistent suggestions is to get professional help from those outside your institution who have the unique experience in rearing these animals and who will have another perspective. Some opinions shared stated a preference to wait a year before interactions to avoid "making the animal a pet" or creating too strong of a bond with human staff members.

## ACKNOWLEDGEMENTS

Personal thanks to the numerous individuals who have shared their views and experiences through various conversations and articles. Special thanks to the Elephant Manager's Association, Alan Rookroft, Charlie Grey, Chuck Doyle, Colleen Kingzley, and the staff members of the various institutions now engaged in rearing young elephants in a captive environment.

Next Month: Nursery Behavior Necessities: Canids

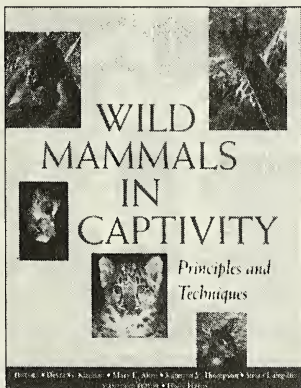
*(About the Author: Since 1978 Diana has been active both in the U. S. and England working with zoos, private collections, an oceanarium, a marine aquarium, and other animal-related organizations involving captive wildlife. She has a broad base of animal experience involving movie & television training, zookeeping, show performances with live animals, education, behavior management, modification and enrichment, rescue and rehabilitation as well as captive breeding and management of endangered species. She currently works as an Animal Behavior Consultant and Trainer for Ark Animals of California working with both exotic and domestic animals. She has authored numerous articles on animal behavior and training. If you have questions for Diana, you may contact her at 1-800-818-7387 or visit her Home Page at <http://www.ni.net/brookhouse.com/>)*

# Wild Mammals in Captivity

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*Managing Editor: Holly Harris*



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# International Directory of Primatology Available

The Wisconsin Regional Primate Research Center, University of Wisconsin, Madison, announces the publication of the third edition of the *International Directory of Primatology*. The purpose of the directory is to enhance communication among organizations and individuals involved in primate research, conservation and education. It may be used by primatologists as a desktop working tool or by educators, librarians, students and the general public as a guide to primate programs and information resources.

The directory is divided into five organizational sections and four indexes. The organizational sections cover (1) geographically arranged entries for major primate centers, laboratories, educational programs, foundations, conservation agencies and sanctuaries; (2) field studies; (3) groups involved with nonhuman primate population management; (4) professional primate societies, including the membership roster of the International Primatological Society; and (5) major information resources in the field. Access to this information is supported by organizational, species, subject and name indexes.

Copies of the 1996 *International Directory of Primatology* (391 pgs., spiral bound) are available in the U. S. for \$25.00 each, or from other countries for \$35.00 (U.S.) each via book rate; \$40.00 (U.S.) for air mail to Canada and Mexico, or \$50.00 (U.S.) airmail outside of North America. Prices include postage and handling. Foreign orders should enclose payment with orders. We cannot accept credit card orders. Checks should be made payable to: Wisconsin Regional Primate Research Center.

Send orders by Post to: Larry Jacobsen, IDP Coordinator, Wisconsin Regional Primate Research Center Library, 1220 Capitol Court, Madison, WI 53715-1299 USA; Phone - 1 (608) 263-3512; Fax 1 (608) 265-4729. Send order by e-mail to: library@primate.wisc.edu

## Coming Events

### 2nd Biennial Zoos Committing to Conservation Conference

December 11-14, 1996 hosted by Busch Gardens in Tampa, FL. For further information, contact Beth Grayson, Zoo Registrar, Busch Gardens, P. O. Box 9158, Tampa, FL 33674-9158 (813) 987-5447, fax 987-5548.

### 17th Annual Elephant Managers Workshop

- January 24-27, 1997 in Jacksonville, FL. Hosted by Jacksonville Zoological Gardens. For further information, contact: Steven M. Wing, Curator of Mammals, Jacksonville Zoological Gardens, 8605 Zoo Parkway, Jacksonville, FL 32218 (904) 757-4463 or (904) 757-4315 [fax].

### AZA Schools for Zoo and Aquarium Personnel

- February 3-8, 1997 - (Professional Management Development for Zoo and Aquarium Personnel; Applied Zoo and Aquarium Biology; Principles of Elephant Management, Studbook I, Population Management; Science of Zoo & Aquarium Animal Management; and Conservation Education Training Program) will be held at Oglebay Park. For further information, contact AZA Office of Membership Services, Oglebay Park, Wheeling, WV 26003.

### 1997 Enrichment Conference

- October 13-17, 1997 in Orlando, FL. Hosted by Sea World of Florida. For more information, contact: Thad Lacinak, 7007 Sea World Drive, Orlando, FL 32821-8097 USA. Call (407) 363-2651.



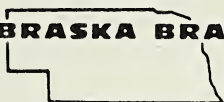
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# ***Legislative Update***

*Compiled by Georgann Johnston  
Legislative Advisor  
Sacramento, CA  
1-800-338-7438*



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## **Biodiversity in East Africa Subject Of UN Computer Database Project**

The United Nations Environment Program's (UNEP) Environmental Natural Resource Natural Information Network Programme (ENRIN) recently put on a workshop on the use of databases to support decision making regarding biodiversity conservation in East Africa. The workshop, held in Nairobi, was designed to assist decision makers and resource managers in their exploration of practical ways of strengthening links between database development activities and decision making processes. Sixty people from Kenya, Tanzania and Uganda attended the workshop.

One major objective of the conference was to offer to countries and conservationists with little time and money to spend on wildlife conservation research a cheap and quick alternative for identifying information about minimum population requirements for a given species, ideas for resource planning, and exchange of information with other countries faced with similar resource conservation problems.

The UNEP provided funding for the conference and intends to continue facilitating access to computerized environmental information for the participants and their governments.

More information about ENRIN may be obtained by contacting Mr. Kagumaho Kakuyo, Regional Coordinator, ENRIN, UNEP, P.O. Box 30552, Nairobi, Kenya Telephone: +254 (2) 623513 and e-mail [Bob.KaKuyo@unep.org](mailto:Bob.KaKuyo@unep.org)

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## **South African Baboons Used For Radiation Exposure Testing in France**

The government of South Africa has approved a request which will allow the French military to export baboons for use in safety testing of nuclear power plants. In August this year, the French Ministry of Defence applied to the South African government for permits to transport at least 20 wild-caught baboons so they could be used in tests to "evaluate the subclinical effects of irradiation doses experienced by people during an accident in a nuclear power plant." The export application states that the research will be conducted in conjunction with the University of California, Los Angeles and a laboratory in Grenoble owned by the French Army.

Environmental groups have filed oppositions to the permit application, stating that since baboons are protected under CITES, and since South Africa is a signatory to CITES, capture and exportation of baboons should not be allowed since the wild population of the animals in that country is not known. Additionally, the animal groups have objected to the plan on the basis that the baboons are to be supplied by an organization known as the Centre Africain de Primatologie (Cape), which has had serious problems in the past regarding its handling of animals awaiting shipment out of the country. For example, in 1990, investigators from the Society for the Prevention of Cruelty to Animals discovered 122 wild baboons and two vervet monkeys in cages on Cape premises who had been without food or care for a prolonged period of time. Because of their poor condition, the baboons had to be killed.

Speaking on behalf of the government, Harold Braak, the chief game warden for Kruger National Park which is home to many of the baboons, has admitted that problems have occurred in the past with the capture and translocation of wild animals such as baboons, zebras and elephants. To solve the problem, a committee made up of government representatives along with delegates from the SPCA and the Wildlife Translocation Association is looking into the application by the French military and is also attempting to develop governmental regulations covering the animal translocation industry in South Africa.

*Source: South African Weekly Mail & Guardian Newspaper 23 August 1996*

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### **Broad-Winged And Sharp-Shinned Hawks Subject Of Recovery Plan**

The Puerto Rican broad-winged hawk (*Buteo platypterus brunnescens*) and the Puerto Rican sharp-shinned hawk (*Accipiter striatus venator*) are the subject of a draft recovery plan put forth by the U.S. Fish and Wildlife Service under the Endangered Species Act. Both species are currently listed as threatened and are found only in Puerto Rico.

Destruction and modification of their habitat, particularly forested areas of Puerto Rico coupled with the construction of roads and recreational facilities are the major threat to these two species. The Service is also concerned that there has been a loss of genetic diversity due to low populations and that the sharp-shinned hawk is also affected by warble fly parasitism.

More information about the draft recovery plan can be obtained by contacting Marelisa Ribvera, Boqueron Field Office, P.O.Box 491, Boqueron, Puerto Rico 00622, (809) 851-7297.

*Source: Federal Register Online vol. 61, no. 183, 19 September 1996*



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## **Congress Acts To Save Antarctica**

On 10 September 1996, the House approved H.R. 3060, titled "The Antarctic Science, Tourism and Conservation Act of 1996." The Senate had approved the bill on 4 September. In essence, the bill implements the United States' obligations under the Protocol on Environmental Protection to the Antarctic Treaty. This treaty provided for broad protections of the Antarctic environment including prohibiting mining for a minimum of 50 years and establishing standards for environmental protection for 10% of the earth.

The treaty and H.R. 3060 governs U.S. research activities in Antarctica and covers all U.S. citizens and companies. The bill mandates that National Environmental Policy Act procedures must be used to meet the Protocol requirement for comprehensive assessment and monitoring of the effects of both governmental and non-governmental activities on the environment, prior to their occurrence. Additionally, the bill requires the development of regulations for waste disposal on the continent.

Treaty signatory countries which still have not ratified the Protocol include Finland, Japan and Russia.

*Source: Sierra Club Defending the Environmental Agenda #273, 19 September 1996*

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## **Pronghorn Antelope And Ocelot Affected By Immigration Bill**

Congress is in the process of debating a number of bills regarding immigration matters. While one might not immediately see the connection between immigration and protection of endangered species the major immigration legislation contains clauses exempting both the Endangered Species Act and the National Environmental Protection Act from border control activities.

Should the immigration bills be enacted as they now stand, they would permanently eliminate consideration of the environmental impact of roads, fences and barriers which could eliminate the natural foraging and/or migration patterns of animals such as the Sonoran Pronghorn antelope and the ocelot. Some astute Congresspersons have offered amendments to the immigration bills requesting that these exemptions be removed from the immigration bills but the conference committee handling the matter declines to consider those amendments.

*Source: GREENlines, a Grassroots Environmental Journal, 25 September 1996*

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## **International Dolphin Conservation Act Passes House**

International protection for dolphins in the Pacific Ocean was approved by the House in a 316 to 108 vote in late August on H.R. 2823. The companion bill,

S. 1420 will be taken up by the Senate in the fall. This legislation, implements the Panama Declaration, an international agreement signed by the U.S. and 11 other countries, which proposes to protect dolphins, tuna stocks, and marine life in the Eastern Tropical Pacific. Among other factors, this bill corrects deficiencies in the tracking and verification system for the "dolphin safe" label, thus improving the veracity of the label — meaning that no dolphins died in order to catch the tuna contained in the product. Additionally, the bill protects endangered sea turtles, sharks and other marine life by requiring nations to reduce their bycatch (waste) through the establishment of internationally mandated bycatch reduction measures.

Opponents to H.R. 2823/S. 1420 have drafted alternative legislation known as the Dolphin Protection and Consumer Information Act (S. 1460). That bill would not implement the provisions of the Panama Declaration, leaving no mechanism to force Latin American tuna fishers to protect dolphins and other wildlife. This bill retains the current "dolphin safe" label definition as merely no intentional encirclement, allowing occasional mortality of dolphins.

*Source: National Wildlife EnviroAction September 1996 and Marine Conservation News Autumn 1996*

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## Keeper Alert...

**Reminder** to all AAZK Chapter Presidents:

An enrichment questionnaire has been sent to all AAZK Chapter Presidents by Dianna Frisch, Chair of the AAZK Enrichment Committee. Please fill out the questionnaire **by 1 December 1996** and return it to:

**Valerie J. Hare, Editor**  
***The Shape of Enrichment***  
**1650 Minden Dr.**  
**San Diego, CA 92111**

If you have not received a questionnaire, please contact Dianna J. Frisch, 7731 Whitneyway Dr., Worthington, OH 43085.

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**KEEPER EXCHANGE PROGRAM:** The Workforce Innovation Committee for the Los Angeles City Zoo has proposed that a keeper exchange program be considered for implementation in 1997. The committee is requesting all zoo and/or keepers interested in participating in an exchange program to contact: **Workforce Innovation Committee, Attn: Richard Floyd, Los Angeles City Zoo, 5333 Zoo Drive, Los Angeles, CA 90027.**



# Chapter News Notes

## Memphis Zoo Chapter

The Memphis Zoo Chapter of AAZK was proud, in the last 18 months, to make several significant conservation-related donations. We gave \$2000.00 to the Russian Egg Project to sponsor the relocation of two White naped crane (*Grus vipio*) eggs from The Memphis Zoo to far east Russia on the Amur River. The program has helped to transport nearly 50 eggs over a three-year period to help rebuild the wild crane population.

We also gave \$1700.00 to the Wolf river Conservancy, a local group seeking to protect the Wolf River in and near Memphis. A nearly 5000-acre tract of land along the river was about to be sold for development when the Conservancy spearheaded a successful fund-raising drive to purchase the land for conservation instead. We also gave \$250.00 to each of four keepers to assist in conference travel expenses. The Memphis Zoological Society is generous enough to match AAZK travel funds, so each keeper actually received \$500.00.

In Bowling for Rhino news - we have held a "Rummage for Rhinos" for the last two years, but our members, docents, friends, relatives and neighbors had nothing left to donate for a third sale, so we decided to try something different. "Rhino Round-up" was a 10-stop scavenger hunt held on zoo grounds during the evening hours. AAZK members manned tables throughout the zoo for activities such as "Name the X-Ray", "Match the Rhino Picture with the Name", and "Scoop the

Poop" (raisins actually). The event was very popular with visitors and we raised nearly \$1000.00. We would like to congratulate our president Dena Mandino for managing to cope with both this event and a 10-month-old baby.

—Kathy Fay, Chapter Liaison

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## AZA Conference Schedule

AZA Eastern Regional Conference, March 19-22, 1997 - Memphis, TN. For further information, contact Carol Cratin, Memphis Zoo, 2000 Galloway Ave., Memphis, TN 38112 (901) 725-3450.

AZA Western Regional Conference, April 9-12, 1997 - Phoenix, AZ. For further information, contact Bruce Bohmke, The Phoenix Zoo, 455 North Calvin Parkway, Phoenix, AZ 85008 (602) 273-1341.

AZA Central Regional Conference, May 15-18, 1997 - Cleveland, OH. For further information contact Jim English, Cleveland Metroparks Zoo, 3900 Brookside Park Dr., Cleveland, OH 44109 (219) 661-6500.

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## **AAZK Announces New Professional & Contributing Members**

Duane Long and Beth Herosy, **Southwick's Zoo (MA)**; Erik R. Swanson and Gina Zullo, **Turtle Back Zoo (NJ)**; Michael J. McClure, **Baltimore Zoo (MD)**; A. Kelly Messenger, **Riverbanks Zoo and Botanical Garden (SC)**; Leslie Malott, **Nelson's Twin Oaks Farm (GA)**; Sarah Berns, **Santa Fe Community College Teaching Zoo (FL)**; Virginia Edmonds and Heidi R. Boyd, **Lowry Park Zoo (FL)**; John B. Kelley, **Grassmere Wildlife Park (TN)**; Demarie Leigh and Charles H. Lewis III, **Detroit Zoological Institute (MI)**; Vernell D. Stock, **Grant's Farm (MO)**; Kathy Sherbo and Tracie D. Winn, **Kansas City Zoological Gardens (MO)**; Sandy Walker, **Rolling Hills Refuge (KS)**; Cynthia Leeson, **Houston Zoological Gardens (TX)**; Cynthia Baker, **Arizona-Sonora Desert Museum (AZ)**; Amy Bono-Kruckewitt, **San Francisco Zoo (CA)**; Patricia Leyva, **Cougar Mountain Zoological Park (WA)**; Erin Sullivan, **Woodland Park Zoological Gardens (WA)**.

### **New Contributing Members**

Salisbury Zoological Park, Salisbury, MD  
Philip E. Foster, Memphis Zoo, Memphis, TN

### **Renewing Contributing Members**

William Hamilton, The Philadelphia Zoo,  
Philadelphia, PA  
Bruce M. Thomas, Takoma Park, MD  
Jack Brown, Director, Santa Fe Community  
College Teaching Zoo, Gainesville, FL  
John Swank, Jr., Columbus Zoo, Powell, OH  
Steven H. Taylor, Director,  
Cleveland Metroparks Zoo, Cleveland, OH  
Fort Wayne Children's Zoo, Ft. Wayne, IN  
Jim Fleshman, Director, Abilene  
Zoological Gardens, Abilene, TX  
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# Book Review

## Ethics on the Ark: Zoos, Animal Welfare and Wildlife Conservation

Edited by Bryan G. Norton, Michael Hutchins, Elizabeth F. Stevens, and Terry Maple  
Smithsonian Institution Press, 1995

900 Jefferson Dr., S.W., Washington, D.C.

Hardback 330 pgs.

*Review by Mike Seidman*

*Keeper-Arizona Trail*

*The Phoenix Zoo, Phoenix, AZ*

This book represents the proceedings of a 1992 conference held in Atlanta. According to the preface by Bryan Norton, the intent of the book is "to focus on ethical issues associated with captive breeding programs... while recognizing that these ethical issues will require a broader exploration of the role of zoos and aquariums in modern society." (p. xxii) In his Preface, David Ehrenfeld asserts that "uncompromising honesty is the most striking feature of this book." (p. xviii) This review will necessarily be highly selective, focusing on sections of the 24 chapters that I feel are most germane to the declared purpose.

While the intentions of the book are adequately fulfilled in regards to the examination of issues associated with captive propagation in zoos, the "broader exploration", though broached by several authors, never really gets underway. Although zoos are criticized from several perspectives, only the animal 'rights' position is countered, and this somewhat simplistically.

In its focus on ethical issues relating to captive breeding of endangered species, the book takes on the question of the morality of sacrificing individuals to "save" a species (Regan, Norton, Hutchins and others), as well as subsets of this question such as when to take animals from the wild (Koontz), the problem of so-called "surplus animals" (Lacy and Donald and Linda Lindburg), and the difficulties of reintroduction from captive stock (Beck). Other essays focus on issues relating to the well-being" of wild animals in zoos (Maple, et al.), the use of animals in research (Hutchins), and the role of zoo public relations (Allen). A 27-page Appendix reproduces the efforts of participants of the conference to reach consensus on how zoos might reconcile their diverse perspective on these issues.

The book is clearly aimed at animal welfare and animal rights critics of zoos, represented here by Tom Regan, a philosopher of animal rights. According to Regan, animals in zoos "are confined and exhibited not because temporary captivity is in their best interests but because their captivity serves some purpose useful to others" (p. 46). Those individual animals that live and die in captivity will, after all, derive no benefits from the eventual proliferation of their species.

Although proponents of animal welfare and/or rights are often criticized for fuzzy logic and uninformed opinions, they are clearly justified in their outrage at our treatment of animals. The source of their anger regarding captive propagation is made plain by Bryan Norton:

"Humans, in our own struggle to control nature, are the culprits who cause most of the dilemmas. Then we, in our wisdom, decide to sacrifice individuals to save species and processes that our own excesses have drawn into risk. It is the march of human

domination that threatens the habitat of other species, and our own, as well. Can we... inflict upon individual members of other species the ultimate sacrifice in order to avert consequences of our own mistakes?" (p. 118)

Most of the writers in this book believe we can. "Like it or not", Hutchins et al. reply, "the survival of many species, especially the larger vertebrates, is going to require unprecedented levels of human intervention." (p. 259) Conway goes further: "Ecosystems and wildlife in the twenty-first century", he asserts, "will be a nature that we recreate and care for..."(p. 8).

But if it's the "march of human domination" that threatens ecological stability, expanding the scope and intensity of our interventions, no matter how well-meaning, is problematic at best. An underlying criticism of technological fixes such as captive propagation is that they focus our attention on the symptoms of the ecological crisis, pushing acknowledgment and confrontation of the causes out of mind.

We are the problem: our desire for life styles that require unsustainable resource extraction and environmental manipulation. Captive propagation, as Lofton puts it, "reinforces and perpetuates the attitudes that make such desperate action necessary in the first place". (p.169) Unless we begin to live differently, species extinctions will soon proliferate beyond our capacity for quick fixes. Will the goal of conservation really be fulfilled when certain privileged species have been "saved" in small, intensively managed parks (megazoots)?

Reading this book one sometimes gets the impression that captive propagation is the sole reason for zoos. Zoos, however, were popular long before there were endangered species. As Lofton reminds us: "The purpose of a zoo is to retain animals in captivity for the purpose of display." (p.178)

The deepest problem of zoos may not be their treatment of individual animals but what they reveal about our culture. While the contract with animals that zoos provide is almost unanimously considered to be wholly positive, there are dissenters. Jamieson, for example, believes:

"The profound message of zoos is that it is permissible for humans to dominate animals, for the entire experience of zoos is framed by the face of captivity." (p.54)

This is a different sort of criticism than that based on animal rights. Beside infringing on the welfare of animals, zoos, Jamieson is suggesting, legitimize the subordination of animals which is a defining feature of our culture. What zoos really teach about our place in nature is the fundamental question; no one in this book, however, aside from Jamieson, asks it.

For all its claims to honesty, the book omits many more questions about zoos than it asks. For instance... For all their serious talk, zoos are still generally perceived as recreational institutions. What does it reveal about our culture's attitude toward nature that people will pay to gather in the presence of captive animals? Is there any evidence that the experience of seeing captive animals in an artificial environment translates into understanding and caring about the lives of those animals in the wild? Does a pleasant day at the zoo accomplish anything beyond a desire to return to the zoo? If people finally respect animals as equal members of the community, will zoos still be considered fun? A truly honest look at zoos should analyze the everyday zoo, not the zoo that purports to be saving species, but the zoo that puts captive wild animals on display for the pleasure of those who are destroying their habitats.



# ***ELECTION..... '97***

Time is running out to get your nominations in for the Board of Directors 1997 election. There are three positions open--those held by Ric Urban, Janet McCoy and Michael Illig whose terms expire at the close of the 1997 National Conference. New board members will serve a four-year term from the close of the 1997 National Conference until the conclusion of the 2001 National Conference. Please fill out the following Nominator and Nominee Biographical forms and send to the address below. **Deadline for submission of nominations is 31 January 1997.** Nominations should be sent to: Sheri Leavitt, NEC Chair, Houston Zoological Gardens, Children's Zoo, 1513 N. MacGregor Way, Houston, TX 77030; fax (713) 525-330.

## **Duties of the Board of Directors**

For a more detailed explanation of the expanded duties of the Board, refer to the By-Laws (available upon request from Administrative Offices in Topeka, KS).

- 1) Select, appoint or remove officers, committees, agents and employees of the Association, including - prescribing powers and duties.
- 2) To control and manage the Association and its property, passing upon acquisition and disbursements with approval of a majority of the Board.
- 3) To formulate policies, rules and regulations in accord with the Constitution & By-Laws.
- 4) To uphold the Constitution of AAZK and the policies of the Association.
- 5) To appear at Board meetings, to accept Board assignments and to devote the time to communications pertinent to all Board business, including answering correspondence promptly and efficiently.

## **Qualifications for Nomination**

- 1) Nominee must be a Professional Member of AAZK, Inc. in good standing and must have been a member of the Association for at least one year.
- 2) Nominee must meet the criteria set forth in the Bylaws of the Association as a Professional member in good standing or be presently employed as an animal keeper/attendant, veterinary technician, research technician or other personnel directly connected with the care, feeding and educational display of captive wildlife in a recognized zoological park, aquarium, animal reserve or other animal care facility in the U.S. or Canada and must have been in the zoological field for at least two years.

## Nomination Procedure

### 1) Nominator Form:

- a.) List the name of the nominee, phone, address, and institution.
- b) State in 150 words or less the reason(s) why the nominee warrants election to the Board of Directors.
- c) Nominator signs forms and mails to NEC Chairperson.
- d) Notifies nominee that they nominated him/her for the Board.

### 2) Nominee Biographical Form:

- a) Professional background: places of employment, length of service, titles.
- b) Membership in AAZK: National and local chapters, number of years, offices held, involvement in activities.
- c) Educational background.
- d) Membership in Affiliate Organizations: (AAZPA, Audubon, etc.)
- e) State in 500 words or less why you would like to be on the BOD and any other pertinent information. (optional)
- f) References (one or two)
- g) Nominee signs forms and mails to NEC Chairperson.

**NOTE:** Candidate is ineligible for nomination if **both** the nominator and nominee biographical **forms** are not **complete** and **returned** to the NEC Chairperson **by 31 January 1997**. Send to: Sheri Leavitt NEC Chair, Houston Zoological Gardens, Children's Zoo, 1513 N. MacGregor Way, Houston, TX 77030; fax (713) 525-3330.



# **Nomination Form for** **AAZK Board of Directors**

## **Qualifications for Nomination:**

- 1) Nominee must be a Professional Member of AAZK and must have been a member of the Association for at least one year.
- 2) Nominee must be presently employed as an animal keeper/attendant by a recognized zoological institution or aquarium in the U.S. or Canada and must have been in the zoological field for at least two years.

### **1. Name of Nominee:**

**Address:**

**Phone:**

**Institution:**

**Director:**

### **2. State in 150 words or less the reason(s) why the nominee warrants election to the AAZK Board of Directors.**

### **3. Signature of Nominator:**

**4. Form must be received by the NEC Chairperson by 31 January 1997. Send to: Sheri Leavitt NEC Chair, Houston Zoological Gardens, Children's Zoo, 1513 N. MacGregor Way, Houston, TX 77030; fax (713) 525-3330.**

# **Nominee Biographical Form** **for AAZK Board of Directors**

(To be completed by Nominee)

**1. Name:**

**Address:**

**Phone:**

**PLEASE LIST THE FOLLOWING INFORMATION**

**2. Professional Background: (places of employment, length of service, titles)**

**3. Membership in AAZK:**

**a) National: number of years**

**Activities:**

**b) Local Chapter(s): number of years, offices held, involvement in activities.**



**4. Educational Background:**

**5. Memberships in Affiliate Organizations: (AZA, Audubon, WWF, etc.)**

**6. State in 500 words or less why you would like to be on the BOD and any other pertinent information. (optional/use additional paper if needed)**

**7. References (one or two): give name, address and phone number where they can be reached:**

**8. Nominee's Signature:**

**9. Form must be received by NEC Chair by 31 January 1997. Send form to: Sheri Leavitt NEC Chair, Houston Zoological Gardens, Children's Zoo, 1513 N. MacGregor Way, Houston, TX 77030; fax (713) 525-3330.**

# *Biology Of The Jaguar*

## *Part Two*

By

*William K. Baker Jr., Zoologist*  
*1209 Tom Temple Dr., Lufkin, TX 75904-5560*

### **Behavior**

Until recently, very little was known about the behavior of the jaguar. Almeida was the first to provide any tangible observations of the jaguar in the wild in his book Jaguar Hunting in the Mato Grosso (1976). He noted that females had no set breeding season in the Pantanal area of the Mato Grosso. He reported hearing jaguars mating on numerous occasions and observed the tracks of pairs at varying times during different months. He observed that females, upon coming into heat, move about searching and calling for a mate far outside their normal territory.

At other times he noted that the jaguar tended to be solitary and that the jaguar has designated hunting territory that it will defend against all intrusion from others of the same species and sex. Almeida mentions observing up to four males trailing a female in estrus and that males, killed during mating or shortly thereafter, were thin and out of condition. This would indicate that males forego hunting to a great extent during breeding. Fighting over females is not common, but does occur among adult males.

When male jaguars fight, it is normally over territory (Mondolfi and Hoogesteijn 1982). The female will not tolerate the presence of the mated male after the cubs are born as the male may kill and eat them. Similar behavior has been observed in tigers, as females with small cubs will not tolerate the presence of adult males in response to possible cannibalism (Mondolfi and Hoogesteijn 1982). This would also reinforce the theory that solitary cats exhibit similar behavior.

Numerous accounts of male and female traveling together have been reported by eyewitnesses. At the La Vergarena Ranch, between the Aro and Paragua rivers, State of Bolivar, a female believed to be in estrus was sighted with three males, one of which had a twisted leg and another that was melanistic. At the Matalopos Ranch, State of Apure, two ranch hands observed a female in estrus that was followed by two males. One of the males walked directly behind the female while trying to drive away the smaller male by means of roars, maiows, and striking at it (Mondolfi and Hoogesteijn 1982).

In the Pantanal region of Mato Grosso, Schaller and Crawshaw (1980) reported a male and an adult female together at the Acurizal Ranch killing but not eating an anteater (*Tamandua tetradactyla*). It was also reported that a particular



jaguar in the Xarayes Marshes Region was a man-killer named "Assasino" by the natives of the area for his particular habit of killing but not feeding. This was the case with many normal prey (cattle, marsh deer, and dogs). It may therefore be possible to presume, (without anthropomorphism) that jaguars kill to preserve territorial integrity against other species. This could possibly be due to antagonism of the jaguar or simply a response to an invader at a non-feeding period of time. However, this cannot be clarified without further study.

A witness, according to Schaller and Crawshaw (1980), once encountered a group consisting of a male, a female, and two large cubs, as well as paired females and paired males on other occasions which could indicate the possibility of a limited social life beyond that of the courting pair. Almeida (1976) states that when the offspring are about one and a half years old that they leave their mother. Two siblings may live and hunt together for a few months while searching for their own territory and, upon finding an appropriate area, they may establish themselves contiguously.

In areas of heavy jaguar population young males are forced to lead nomadic lives, moving into the home range of older males and being chased out until they become established in their own home range. Schaller and Crawshaw (1980) report of finding, on the Acurizal Ranch, a female jaguar that was independent and at least two years old, that continued to share her mother's range. Each traveled alone, except on one occasion they shared a kill, yet their tracks tended to be in the same area at the same time. This association continued until they both were killed at the same time. The young female was believed to be about 2 1/4 years old.

"Panthera cats such as the lion (*P. leo*), tiger (*P. tigris*), and leopard (*P. pardus*) may delineate their ranges both directly by roaring and indirectly by scraping the ground with their hind paws, defecating or urinating on scrapes or at prominent locations, clawing trees, and spraying urine (Schaller 1972). The jaguar at Acurizal and Bela Vista seemed remarkably restrained about advertising their presence by such methods. We spent many nights in the forest but never heard the characteristic jaguar roar, a sequence of loud, horse grunts. We followed fresh jaguar tracks for a total of 39 km (24 miles) without noting a scrape, except once when a female had been chased by dogs. By contrast, puma (*Felis concolor*) at Acurizal left ten scrapes in 16 km (10 miles); two scrapes had been marked with urine and one with feces. The route of a tiger can often be detected from pungent urine marks left on bushes and trees (Schaller 1967), but that of a jaguar could not. Feces were seldom discovered, possibly because the jaguar made little or no effort to display them. Jaguar occasionally raked their claws down tree trunks, some trees being used repeatedly, but since puma showed similar behavior it was often impossible to ascertain which of the two cats had made the marks" (Schaller and Crawshaw, "Movement Patterns of Jaguar", BIOTROPICA 12(3), P. 164, 1980)

However, Rabinowitz and Nottingham in their study performed in Cockscomb Basin, Belize (1986) had no trouble finding feces openly on cattle trails that

were also used by the jaguar in the area. Their success was so significant that they were able to determine dietary habits of the region's jaguar by physical examination. This may have been due to the overlapping home range of the jaguars in the area. Mondolfi and Hoogesteijn (1982) noted that they leave claw marks on tree trunks, and it was believed that this was more to sharpen claws than to serve as any form of communication. They also made mention of a statement made by Darwin while he was hunting on the banks of the Uruguay. He had noted that certain trees were marked at different ages by scratches. In a reference to Almeida it was noted that jaguars have favorite trees that they will sharpen their claws on. Specifically mentioned are trees on which jaguars clean their claws. These trees, the "morcegueira" tree (*Andira inermis*) which has a thick trunk and rough bark, are usually a specific hardwood found in the northern swamps of the Pantanal of the Mato Grosso. It was reported that finding claw marks on one was a sure sign that a jaguar is in the area. At the El Socorro Ranch, near El Baul, Cojedes State, a "sandregrego" tree (*Pterocarpus officinalis*) with a sloping trunk showed scratches made by a jaguar. As the claw marks were at different heights, it was presumed that the tree was being used regularly for climbing.



The key to maintaining a jaguar's territory would appear to be communicating by vocalizations. It was reported that in some parts of the Mato Grosso Region (Capstick 1981) that jaguars are often vocal. In Venezuela it was reported that they called often in some areas (Mondolfi and Hoogesteijn 1982).

The vocalizations were described not as the true roar of a lion, but rather being composed of a series of five to a dozen repetitions of a short, hoarse coughing. This is usually started with short guttural "uhs" that increase in volume until after several repetitions the final "uhs" have appalling power and effect. Hunters in Venezuela often refer to this as "snoring". By listening to tapes of a three-year-old male jaguar in captivity, Mondolfi and Hoogesteijn (1982) were able to ascertain that males grunt in a sequence ranging from 17-22, with a longer time lapse between the last four to seven notes of each sequence.



The male may also be distinguished from the female as the male has a stronger and more resounding call when compared to the softer call of the female although the intensity will increase when the female enters estrus. It was also reported that males will call more frequently at the beginning of the rainy season. A female jaguar in heat will travel at night advertising her presence for a mate with 5-7 grunts that can be heard late into the night or until sunrise. When answering a female, the male's call will be far more hoarse and guttural. The jaguars' habit of answering a call of another individual is taken advantage of by hunters who lure a cat by the use of a "corotear", a call constructed out of a hollow gourd that is used by either grunting into it or by pulling a piece of rawhide through it to simulate the characteristic jaguar grunt. As Capstick (1981) tells it, an extremely effective device once called a jaguar out of the water and into a canoe to the point that the hunters had to beat it out of the boat with paddles.

The home range of the jaguar has been established to be 25-38 km (10-15 sq. miles) for females and at least double that for the males (Schaller and Crawshaw 1980) while jaguars in the Pantanal Region of Brazil were reported to have home ranges of twice that figure. Adult males had a home range of 28-40 km (10-15 sq. miles) while the females moved over a minimum area of 10km (4 sq. miles.). Adult males typically had a home range that encompassed several females' (2-3) territory and would defend it against all jaguars except sub-adults and females (Schaller and Crawshaw 1980). In the event of a death of a jaguar, the vacant home range was filled by a jaguar that had a contiguous home range. That jaguars' vacant home range was then filled by an outside jaguar (Rabinowitz 1986).

The jaguar is primarily a nocturnal felid in its feeding and movements (Schaller and Vasconcelos 1978; Mondolfi and Hoogesteijn 1982). They usually tend to rest between mid-morning and afternoon, but some daytime activity and movement is fairly common, and they will even hunt during the day when compelled. Schaller and Crawshaw (1980) established by means of radiotelemetry that the supposedly nocturnal jaguar often wandered during the daylight hours. In studying the habits of a collared female, they determined that the jaguar often wandered about at mid-day although she was most active the hours after dusk until dawn. During the day jaguars lie down and rest, always in deep shade and usually in thick cover, sometimes in caves under boulders or in large holes in river banks (called "solapas"). They have been known to rest outstretched on thick horizontal tree limbs. In certain regions, during the flood season, jaguars are forced to climb trees in order to rest out of the wet (Almeida 1976). The peak activity hours were:

Late Morning:	0930-1200 hrs.	(Rest)
Midnight Hours:	0030-0300 hrs.	(Rest)
After Dusk:	1830-2100 hrs.	(Active)
Predawn:	0330-0600 hrs.	(Active)

The jaguar is very dependent on water and consequently has a marked preference for the immediate vicinity of water courses and lagoons (Mondolfi and Hoogesteijn 1982). This becomes an imperative need during the dry season when water becomes scarce and the jaguar must drink more frequently. This, as a consequence, restricts the jaguar to cover near isolated pockets of water. It has been observed on numerous occasions that jaguars are water-loving cats, probably the most water-loving cat in the world, notes Almeida (1976). They report that jaguars often seek relief from the heat in rivers and of sighting one swimming across the Orinoco River during the rainy season when the river was 8-10 km (5-6 miles) wide. It is a very able swimmer capable of even carrying a kill in the process. A jaguar was sighted in the Cano Ave Maria carrying a heifer kill, which it then hauled on top of a tree that was above the flood level (Almeida 1976).

## **Feeding Ecology**

The jaguar has a wide variety of prey that composes its diet:

### **Main Prey Species**

Capybara (*Hydrochaeris hydrochaeris*); Spectacled Caiman (*Caiman crocodylus*); Galapagos Turtle (*Podocnemys vogli*); Terecay Turtle (*Podocnemys unifilis*); Collared Peccary (*Dicotyles tajacu*) (Mondolfi and Hoogesteijn 1982; Schaller and Vasconcelos 1978; Guggisberg 1975)

### **Lesser Prey Species**

Armadillo (*Dasypus novemcinctus*); Paca (*Agouti paca*); Collared Anteater (*Tamandua mexicana*); Giant Anteater (*Myrmecophaga tridactyla*); Lesser Anteater (*Tamandua tetradactyla*); White-tailed Deer (*Odocoileus virginianus*); Land Tortoise (*Geochelone carbonaria*); Iguana (*Iguana iguana*); Porcupine (*Coendou prehensilis*); Howler Monkey (*Alouatta seniculus*); Arrau Turtle (*Podocnemys expansa*); Sloths (*Bradypus*); Giant Armadillo (*Priodontes maximus*); Red Brocket Deer (*Mazama americana*); Agouti (*Dasyprocta punctata*); Opossum (*Didelphis marsupialis*); Coati (*Nasua nasua*); Four-eyed Opossum (*Philander opossum*); Skunk (*Spilogale putorius* or *Conepatus semistriatus*); Kinkajou (*Potos flavus*).

### **Occasional Prey Species**

Domestic dogs, Domestic livestock, Snakes, Birds, Ocelot (*Felis pardalis*), Puma (*Felis concolor*), Man (*Homo sapiens*), Horses (Mondolfi and Hoogesteijn 1982; Rabinowitz and Nottingham 1986).

## **Hunting And Killing Techniques**

The jaguar has a characteristic killing technique that is typified by killing with a deep bite to the throat that suffocates the prey, or more often with a bite that pierces the back of the skull at its weakest point, frequently crushing the zygomatic arch, and with such precision as to place the canines precisely in a 3 x 3 inch area that could be placed into the ear and cranium of its prey.



Afterwards the jaguar drags the prey to a thicket or secluded spot. The digestive tract is usually disposed of by being pulled 2-3 m (6-10 feet) away. The ventral surface of the prey is eaten first; the neck, chest, heart and lungs, and the shoulders (Schaller and Vasconcelos 1978).

For reptiles the technique is slightly different. The jaguar pounces on the alligator or caiman from behind immediately biting through the neck thereby severing the cervical vertebrae and rendering the reptile unable to lash itself into the water. When eating a turtle, the jaguar introduces his paw into the shell through the opening between the carapace and plastron and scoops out the flesh without breaking the shell. Porcupines are simply flipped onto their dorsal side, and the exposed flesh is scooped out with the paw (Mondolfi and Hoogesteijn 1982). In all cases the jaguar attacks from cover and usually from a blind side with a characteristic pounce.

## **Reproduction**

According to Mondolfi and Hoogesteijn (1982) and to Audobon, mating and birth can take place at any time of the year. Jaguars breed successfully in captivity and are classified as aseasonally polyestrous. Litter size (in births at zoos) is 1-4 cubs. Generally two cubs are born. Afterwards litters of one cub per litter are the next in frequency. Three cubs to a litter is less common and four cubs to a litter is rare. Females reach sexual maturity at 2 -2 1/2 years of age. Males reach sexual maturity at 3-4 years of age. At birth cubs weigh 850-865 gm (1.9 lbs.) and are furred with a long-pale buff pelage, heavily marked with round black spots (With faint indications of pale centers) and narrow black facial stripes.

## **Hunting Stress**

The jaguar has been under considerable pressure due to conflict with the livestock industry for many years. This is mainly due to the jaguar preying on cattle, horses, and other domestic animals. The jaguar is protected, but the general procedure by ranchers is to kill all jaguars on sight. What occurs more often than not is that they are simply wounded, as the shotgun is the only legal weapon in many countries (Mondolfi and Hoogesteijn). This is typically what produces a livestock killer or man-eater (Capstick) as the animal is usually only wounded. Since the jaguar became protected and regulated (# of hunts annually) in most of Latin America and South America, a black market trade has flourished uncontrollably. Although trading in spotted cat pelts is illegal, it still continues, as pelts are sold on the black market.

## **Specimens In Captivity**

Jaguars kept in captivity breed readily and generally adapt well to zoo life as long as the enclosure is of a reasonable size and duplicates wild conditions: otherwise the specimen may exhibit stereotypic pacing or self-destructive behavior. One specimen kept in a concrete enclosure exhibited cracked pads and early symptoms of arthritis in its foreleg. Transfer to a larger grass enclosure

and treatment of the pad with 1cc Gentocine® produced good results without a relapse. Zoo specimens are typically fed Meat Diet 1 in a 5 pd roll on a daily basis. A jaguar kept in good health in captivity can be expected to live from 14-30 years. Average body temperature is 100°-102°F/37.8-38.9°C. Gestation tends to run 93-110 days on the average, with weaning in five months, and maturity reached in 30-48 months (Hillcrest Zoo, Clovis, N.M.)

## **Methods Of Tracking And Capture**

Jaguars are taken by two standard methods:

1. Dogs are used to chase and tree cats, whereupon they are darted.  
Sedative: ketamine hydrochloride (Parke Davis & Co., Detroit, MI)  
Dosage: 22 mg/kg of body weight (Rabinowitz 1986)
2. Jaguars are trapped in live bait cages, (live pig) and are then darted.  
Sedative: ketamine hydrochloride (Parke Davis & Co., Detroit, MI)  
Dosage: 22 mg/kg of body weight (Rabinowitz 1986)

Tracking is facilitated by radiotelemetry collars containing activity monitors (Telonics, Mesa, AZ). Tracking is performed using ground-based, hand-held antennas.

## **Discussion Of Conservation Methods**

The jaguar faces the shared future of most occupants of the tropical rainforests. That is, living within an increasingly shrinking ecosystem that is subjected to pressure brought on by population growth, development, and ineffective agricultural techniques. The use of the "slash and burn" approach to agriculture can be replaced with international trade and modern agrarian technology and management. Through governmental planning, management, and regulation it is possible to plan on the national level the direction that the environment will take. However, environmental management and conservation efforts will only be effective if the laws and regulations are enforced on a national level. The key to winning support for conservation is education supported by active research and endorsed by the national will.

In order to insure species survival it is necessary to look beyond the individual species and towards the environment in which it resides. Effective wildlife management begins with viewing an ecosystem as an interactive environment of living organisms and not merely components. Through the development of education, preserves, and interest groups it may be possible to ensure the jaguars' survival.

## **Acknowledgments**

I would like to take the opportunity to thank Marge Moore of the Hillcrest Park



Zoo, who gave me access to data, records, and cats for my initial work. Also, thanks go out to Chris Pfefferkorn, Patti Hainley, and Jenifer Kimmey of the Ellen Trout Zoo for access to data and cats.

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**Great Lakes Regional Update** - The Great Lakes Regional Council met during the Detroit Conference. Bruce Elkins, Indianapolis Zoo, has volunteered to be Council Liaison for 1997. The Council is trying to reorganize its mailing list and would like your help. If you wish to be on the list, please send a letter, e-mail or call:

Bruce Elkins, Head Keeper  
Indianapolis Zoo  
1200 W. Washington St.,  
Indianapolis, IN 46222

Phont: (317) 630-2031  
e-mail: belkins@mail.Indyzoo.com

Please include your name, address, phone, fax and e-mail, if available. Regional Meeting minutes will be distributed to those on the list in November/December 1996.

# ***Crate Training Protocol for a King Vulture Utilized at Brookfield Zoo***

*By Anne Oiler, Senior Keeper  
Bird Dept., Brookfield Zoo  
Brookfield, IL*

Exhibits that feature free flying birds are among the most popular in zoos. The birds can distance themselves from the public but still display natural behavior such as foraging and nesting. These exhibits are also rewarding for the keepers who work in them, but unfortunately it is not always an easy task to remove the birds. Mist nets and trap cages can be utilized but these methods are time-consuming and not always reliable, especially with wary birds. This became glaringly apparent when we needed to remove the King vulture (*Sarcoramphus papa*) from Tropic World-South America, a very large, mixed species exhibit containing primates, birds, and other mammals. This exhibit measures 1002 sq. meters (11,00 sq. ft.), 23m (75 ft.) high.

The king vulture, that was parent-reared at another institution, has been housed in this exhibit since 1987. She has proven to be an excellent exhibit bird, highly visible but cautious of people. She is curious about keeper activities but maintains a safe distance and will fly across the exhibit when she feels threatened.

All birds are removed from the exhibit for annual health checks. We have developed a trap system utilizing a video camera and monitor to distance the keeper from the trap area. This allows birds to access the trap cage without visual contact with keepers. The trap cage is a wood and wire screened cage measuring 4.5m L x 3.6m W x 4.3m H (15' L x 12' W x 14'H). A string is tied to the doors and runs through the back of the cage into a darkened hallway allowing the keepers to close them from a distance. Unfortunately, the vulture was extremely suspicious of the cage, which we attributed to her seeing or hearing the keeper, and she refused to go into the cage for several days.

One primary keeper worked the area for several years. In 1993, the vulture became acclimated to this keeper and would perch on a concrete ledge near the service area while the keeper worked. Although somewhat skittish, she would stay on the ledge when food was offered. Encouraged by this, we decided to attempt to train the bird to walk into the trap area on command, and eventually into a #700 Vari Kennel® brand crate, measuring 1.0m L x 0.69m W x 0.76m H (40" L x 27" W x 30" H).

The procedure was discussed with Marty Sevenich, the zoo's training coordinator, and steps were outlined. Training sessions of approximately 15 minutes were held twice a day. Because the bird occupies a mixed species exhibit where she

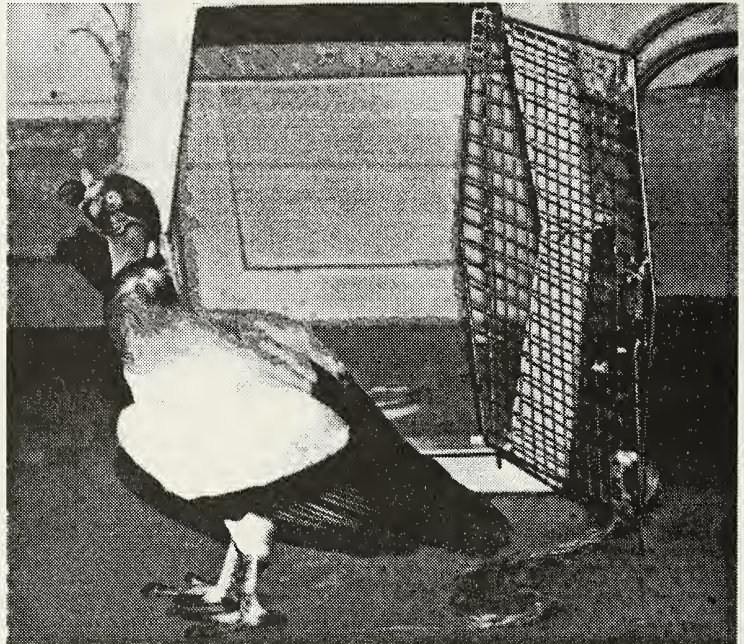


has access to a number of feeding stations, we did not withhold her normal diet. The diet quantity was not altered, with the main portion being fed in the trap area to be eaten after the keeper left for the day. New items that were more motivating to the bird were offered only during the sessions as reinforcements. Pieces of adult mice, Nebraska Brand® Bird of Prey (Animal Spectrum, Inc.) and newborn mice, referred to as pinkies, were offered, but the pinkies soon became the favored item.

The training was accomplished in steps. Normally the bird would perch on a large concrete ledge when watching the keeper activities. The reinforcement was left on the ledge at a specific location and the bird was required to hop to the station with the keeper standing nearby. If the bird would not come near the keeper, the treat was removed. Over time the stations were progressively moved across the ledge and onto the floor of the keeper area. Each step had to be mastered, that is, the bird moving without hesitation, before the next step was undertaken. If the vulture would not participate after 10 minutes, the session was ended. Gradually the bird came to the floor and then into the trap area. We then began working with the Vari Kennel® inside the trap area. Her nightly diet was placed at different locations inside the kennel to allow the bird to become comfortable going into the kennel without a keeper present.

**King Vulture  
awaiting the cue  
to enter the  
kennel.**

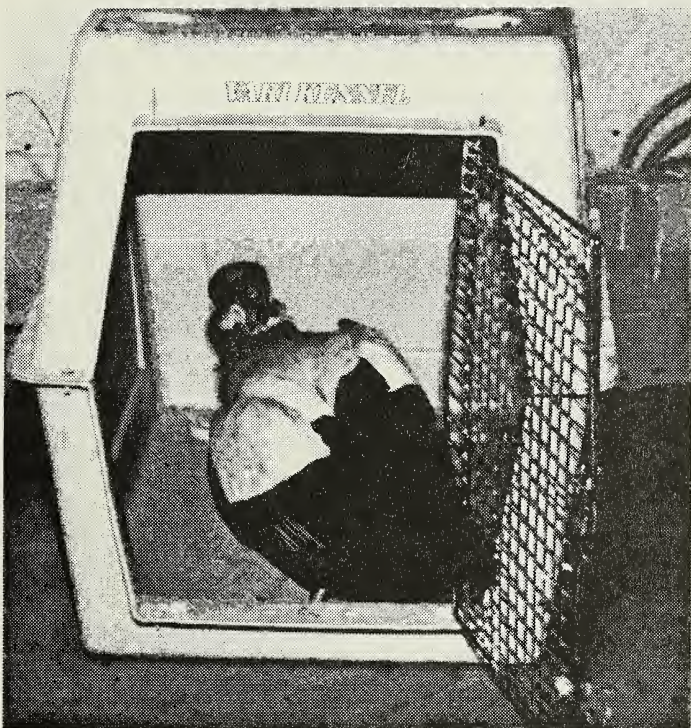
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Society Audio Visual  
Services 1995. Photo  
by Mike Greer



The original plan was to work through the steps with the kennel door removed, then attach it and repeat the process. However, due to time constraints, we attempted the training with the door already attached. The door was wired in place to prevent it from accidentally banging closed and scaring the bird. First she was required to take food from the front of the kennel, then from the threshold, then further inside until she had completely entered the kennel.



Once she was accustomed to entering, reinforcements were offered to get her to spend more time in the crate. By varying the size of the reinforcement, the bird would not know if she would get a large or small amount for completing the task. This common training technique keeps the animal's interest on the task because it cannot determine beforehand if the reward is something it wants. Once she was comfortable with this step, the door was closed for brief periods until she was comfortable spending longer periods inside.



**The King Vulture  
will stay in the  
crate while  
anticipating her  
reward.**

*©Chicago Zoological  
Society Audiovisual  
Services 1995. Photo  
by Mike Greer*

The complete training process took approximately 14 weeks, requiring 30 minutes per day. Throughout the entire period the bird's behavior and diet was not restricted and she willingly worked through the process. Although initially she was comfortable working with only one keeper, she is now accustomed to others. Any procedures or moves involving this bird can be planned and executed with minimal stress to both the bird and keepers. The training sessions have continued, requiring 15 minutes per day. The bird has been moved several times over the past three years and continues to follow the training behaviors. Additionally, we have continued her training and she will now step onto a scale so we can monitor her weight without restraining her.



# Tanjung Puting

## Home of the Red Ape

By

*Robert Berghaier, Senior Keeper  
Zoological Society of Philadelphia  
Philadelphia, PA*

It is the tenth of October 1994 and I am in a small plane above the Java Sea heading from Semarang, East Java to Pangkajene, Kalimantan. When I arrived in Jakarta via Singapore three and a half weeks before, my host had asked me if I had seen any evidence of a smoky haze at the Singapore Airport. There had been numerous news reports of problems at the airfield due to massive forest fires raging in Sumatra and Borneo. The smoke from these fires was allegedly so intense that some flights into Singapore had to be rerouted and air quality in the city had been severely affected. The fires had become an international incident because Indonesia had been denying that the smoke had originated from its territory. I did not observe anything out of the ordinary at that time.

When my flight reached Borneo I saw firsthand what my friends in Jakarta had been concerned about. South Kalimantan was ablaze. Numerous pillars of black smoke rose up from the ground as far as I could see on either side of the aircraft. The fires were the result of massive debris left from excessive logging combined with an unusually long dry season. My plane successfully maneuvered through the smoke and landed at Pangkajene. The fires and their plumes of smoke make an interesting introduction to Borneo.

I was met at the airport by Riksa Sari, my guide for the next seven days in Kalimantan. Riksa, or Lisa which is the English version of her name, was a Dayak woman in her early twenties. Riksa can be considered an individual representative of the recent wave of change that has washed across all of Kalimantan. She was born in a small village up river from Pangkajene. Riksa remembers going into the forest to gather fruits with her mother and how her father hunted wild game. Her family moved to the town of Kumai when Riksa was a young girl and she spent the rest of her life there. Riksa obtained a formal education and proudly informed me that she was the only government licensed female guide in all of Central Kalimantan.

We gathered my gear and took a cab for a short ride from the airport to the port of Kumai. The headquarters of Tanjung Puting Park is located here and Riksa arranged the necessary permits that we would need for my journey to the reserve.

Docked on the pier at the rear of the headquarters building was my combination transportation and shelter for the next seven days, the kelotok "Garuda". Kelotoks are small thirty foot wooden boats named for the sound the boat's small engine makes as it travels along the rivers of the region. The craft is aptly named. (Traveling on the craft one hears "kelotok, kelotok, kelotok" constantly in the background.) They are a sturdy, comfortable craft and can be easily maneuvered through the narrow waterways that form the major transportation routes of the island.

Riksa introduced me to the other three members of our party. Yatno was the captain of the Garuda, in his mid-twenties, and the oldest of the group excluding myself. He had an incredible eye for wildlife. Yatno would often sit on the top of the chair by the kelotok's steering wheel and control the wheel with his feet, his head above deck, spotting animals for me. Udin, the cook from East Java, was in his teens; but in spite of his youth, that lad could cook! He produced some of the spiciest meals I had during my seven week stay in the islands.

We set out just after noon through the port of Kumai. Several large wooden phinisi schooners were in the harbor being loaded with lumber. Although the petroleum industry generates more income, timber is the second leading provider of foreign exchange in Indonesia. I was to learn later how that industry threatens the wildlife of Tanjung Puting.

We traveled down river for an hour and made a left in the mouth of the Sekonyer River. Initially the banks were lined with thick Rhizophora palms which, after another hour turned into forest interspaced with clearings which are an indication of current or previous rice cultivation. Tanjung Puting National Park is a relatively recent creation. Dayaks have lived on both sides of the Sekonyer for hundreds of years. Since the park's gazettement in 1982, the east bank of the river has been cleared of inhabitants. The west bank contains several settlements, fields and numerous illegal logging camps.

We stopped at the orangutan rehabilitation station at Tanjung ("Tanjung" means "cape") Harapan. Riksa explained that the camp presently holds four young confiscated orangutans who are being trained to fend for themselves. These four animals are given supplemental feedings of vitamin enriched milk and bananas twice a day. Another recipient of the rations are two adult female orangutans with babies. The two mothers, who became pregnant by wild males in the forest, are there to hopefully act as role models for the young oranges undergoing rehabilitation.

Among the young orangutans was Winnie, who lost her right arm due to infection after she was removed from her mother who had been killed in a logging operation; Jackie, who clung to Riksa whenever she came near him; and Gustav, who tried to bite the ankles of every human who came close. The youngsters of Harapan must be locked in small cages every evening. These babies are too young, or in Gustav's case, unwilling to make a night nest off the ground. Unless the youngsters keep off the forest floor they can fall victim to the bearded pigs which will kill and eat any helpless primate they find on the ground. Once they learn to make a nest, the young oranges will be sent to the next rehabilitation station up river at Pondor Tanggul. The incorrigible Gustav, who made night nests at Harapan, refused to make one at Pondor and was therefore sent back. Perhaps he missed the attention but more likely he missed the extra rations given at Tanjung Harapan.

It was near dusk as we traveled up river to Pondor Tanggul where we would tie up for the night. As the light faded, Yatno pointed out the numerous proboscis monkeys and long-tailed macaques who lined both banks of the Sekonyer. Dozens of groups of both species were gathered in the tall trees on either side. I have never seen such a concentration of primates anywhere in my travels. Hundreds of animals were scattered in the forest along the banks of the river. Within an hour I had seen more animal than in four trips to the Amazon of Peru and Ecuador. There were numerous birds including black bittern, storm stork, white-breasted water hen, chestnut breasted malkoha, Asian



black and wrinkled hornbills, long-tailed parakeet, and green imperial pigeon. It was a wealth of wildlife for one day and I had six days remaining.

We awoke early the next morning and met ranger Rudi as he made his morning rounds checking and feeding the eight young orangutans in his charge. Unlike the clinging babies at Harapan, these apes kept their distance from us. Riksa told me that human contact is discouraged at this station. Eventually these animals will have their supplemental rations cut to encourage them to forage for themselves. It is hoped that they will eventually leave Pondor and return to the forest and complete their rehabilitation.

We headed up river to our next destination, Camp Leahey, the site of Dr. Birute Galdikas's long-running wild orangutan study. Enroute Yatno shouted, "Bob, wild oranges!" and pointed to the west bank of the river. Sure enough, there were two full-grown males brachiating thirty feet above the ground. They disappeared quickly and I still find it astounding that Yatno, who was steering the kelotok at the time, even saw them at all. Riksa told me that I was very lucky for she has had many clients who have not seen wild oranges at all. While the rehab apes are easily seen, the wild apes move quickly and quietly through the forest and are therefore very difficult to observe.



There was more wildlife ahead. The crew showed me at least five false ghavials and ten water monitors that were sunning themselves along the river banks. Two of the ghavials were over six feet, a size that enables them to prey on monkeys or macaques which often swim from one bank to the other. Several of the monitors were near six foot in length as well. I spotted a few different species of birds that I had not seen the day before. They included purple herons, greater coucals, Malaysian eared-nightjars, stork-billed and blue-eared kingfishers, hill mynas, crimson and olive-backed sunbirds, and oriental darters.

We disembarked at Camp Leahey and Riksa checked in with the park rangers. She found out that Dr. Galdikas was in the camp and she asked me if I wanted to meet her.

I agreed and she led me to the doctor's cabin. The doctor was in the middle of a struggle to keep a rehab adult female orang with baby from attempting to smash her way into the doctor's cabin. The female was trying to get mangoes and Dr. Galdikas was running low on her own supply. The doctor managed to slip a half-dozen to her persistent antagonist who finally left the front porch.

It was then that we were able to converse uninterrupted. I had met Dr. Galdikas during a visit to the Philadelphia Zoo in 1981. When reminded of this, she remembered clearly the seven orangutans that we had in our collection at the time. We discovered that we had another link via a mutual friend from Philadelphia, an artist, who has done some excellent sketches of Tanjung Puting orangs. After a half hour of small talk, Dr. Galdikas asked me if I wanted to accompany her as she checked on four wild orangs who were the subject of that week's behavioral observations. This was an extraordinary opportunity which I quickly accepted.

We set out after lunch and managed to contact a mother orang and youngster who were two of the doctor's focal animals for that week. Dr. Galdikas tries to have three animals, one male and two females (including any accompanying offspring) followed per week within the 40 square kilometers that encompass the Camp Leakey research station. If the focal subjects are doing something of interest, such as a female in heat, the animals may be followed for a longer period. These types of long-term observations are similar to those undertaken by Dr. Goodall's Gombe chimp project and the mountain gorilla studies of the Karisoke Research Center. In my opinion, this type of data collection is the only effective method of understanding such sophisticated, long-lived primates.

As we walked through the forest Dr. Galdikas told me about the status of the park and other conservation issues of Kalimantan. The numerous camps that I had observed on the west bank of the Sekonyer river are the result of illegal logging. The doctor explained that it is nearly impossible for Kalimantan residents to get legal logging permits. These permits are issued from Jakarta and are granted to well-connected individuals or recipients who are able to pay substantial bribes. Timber is one of the most dependable earners of hard cash; so local businessmen, who are shut out of the legal timber industry, are forced to finance illegal forestry operations. As a result, the forest that supports such an incredible number of wildlife is under a very serious threat. That concentration of primates I saw on the banks of the Sekonyer relies on the forest on both sides of the river to support its numbers. Dr. Galdikas told me that each bank had already been skimmed of the most valuable trees and the present wood cutting on the west side is being used for plywood and paper products. She told me that she has seen more habitat destruction in the Tanjung Puting area in the past eighteen months than she had seen in her entire twenty-two years in the region.

We attempted to find the adult male, named Bert, who was under observation but the doctor's group of Indonesian rangers and students lost the animal. Another team, however, had contacted a new male, who we observed briefly before heading back to camp. This individual would be followed the next day in case the aforementioned male had left the area. Dr. Galdikas graciously invited me out for another day of orang observations and I accepted.

I awoke early the next morning and after breakfast, headed back to the doctor's cabin. On the path I got a quick glimpse of what I think was a slender tree shrew. While I was waiting for Dr. Galdikas to finish lecturing to her students and staff, I started playing



with a kitten that wandered by. I was joined by a rehabilitated female orang with baby who was very interested in the cat that I held in my lap. The female grabbed my right ankle in a firm grip while she tried to snatch the kitten. I lifted the cat above my head to keep it out of her reach. Once she realized that I would not turn over the cat, I believe she decided to wait me out. The orang held on to my ankle, staring into my eyes for what seemed at the time hours, (in reality probably only twenty minutes), waiting for me to put the kitten down. The cat was very relaxed in my lap although it did tense up noticeably when the ape moved towards it. Eventually the orang released her grip on my ankle, moved away and climbed a nearby tree.

Dr. Galdikas joined me, along with Mr. Ralph. (Indonesians often refer to one another as "mister". The doctor, for example, always referred to me as "Mr. Robert". Mr. Ralph had been a volunteer at Camp Leakey for many years. His accent pointed to his Brooklyn NY roots and his gray hair and beard to his senior citizen status. In spite of his age, Mr. Ralph moved through the forest with the ease and confidence of a man half his age.

Today, the doctor informed me, we would visit both the new male orang contacted yesterday and the missing Bert. We found the aforementioned male quickly. The doctor attempted to make a visual confirmation of the animal's identity while Mr. Ralph tried to take a photograph that could provide a more definitive ID. She thought that the new male was an individual named Zorro. We stayed with him for an hour then moved off to find Bert.

Enroute, Dr. Galdikas gave me a brief description of the activity patterns of Tanjung Puting male and female orangutans. The females must have one of the least active lives of any primate. They wake from their night's rest at 10:00 a.m.. This allows the orang researcher a leisurely morning complete with breakfast before setting out to find the subject for the day. This is in marked contrast to other primate species I have followed, such as sifakas and titi monkeys. With these species, one has to awaken before dawn and eat a hurried snack while on the trail to find the creatures before they start moving or calling at first light.

The orangs forage for the next two hours until noon. Finding food is easy. Over 400 types of fruits, leaves, bark, and flowers have been recorded to have been eaten by the orangs studied at Camp Leakey. The orangs usually rest for two more hours until approximately 2:00 PM when they start foraging again. At 4:00 PM, the apes park themselves in the top of a tree or its large cross limbs and gather any nearby branches and leaves to make a night nest.

According to Dr. Galdikas, the male orangs follow the same general activity pattern. The exception is that the males cover more territory, the result of their searching for females in heat. The males will remain in an area only if there are receptive females nearby. Dr. Galdikas told me that some of the wild males around Camp Leakey have been spotted traveling through the research sight maybe only once every five years, with sometimes as many as ten years going by between visits. Fighting among males, while not observed often in the field, must be fierce. The doctor said that the most easily observed identifying characteristics of wild males are the result of injuries suffered through their fighting. Many of them are missing fingers or toes, or have large gashes in their cheek pads which can facilitate the identification of individual males.

We found Bert and stayed with him for over two hours until he started making his night nest at 3:45 p.m.. While we were watching him a short rain shower started. Immediately

Bert made a nest and covered himself. Dr. Galdikas said that orangs will always do this during any precipitation to avoid getting wet. This behavior should be very familiar to orangutan keepers.

On the trail back to Camp Leakey we spotted a young bearded pig which bolted across the trail in front of us. As we entered camp, a tiny squirrel ran ahead of us and I later identified it as a plain pygmy squirrel. One animal that I had hoped to see that day was the red leaf langur. Dr. Galdikas said that while we were watching Bert she heard a group moving towards us in the forest canopy. Unfortunately we saw no sign of them. She told me that they are a very quiet animal and as a result, difficult to see.

We spent the evening down river from the camp. I awoke at 5:00 a.m. the next morning to the sound of gibbons calling. After breakfast we started up the Sekonyer to our next destination, the proboscis monkey research station at Natai Lengkuas. Again there were numerous birds to see along the river: oriental darter, purple heron, black bittern, white-breasted water hen, white-bellied sea-eagle, green imperial pigeon, cinnamon-headed green pigeon, long-tailed parakeet, greater coucal, stork-billed and blue-eared kingfishers, Asian black and wrinkled hornbills, slender-billed crow, crested serpent, black eagles, olive-backed sunbird, spectacled spiderhunter, and pied fantail. There were no ghavials but we did see two monitors.

Riksa suggested that we visit a new gold mining area located up river from the research station. This way we would spend the warmest part of the day (95° F/35° C) seeing the mining operation and save the "comparatively cooler" (90° F/32° C) late afternoon for a hike in the forest at Natal looking for wildlife. In actuality, I was equally uncomfortable during both periods of the day. There was a large amount of deforestation evident on either bank of the Sekonyer as we came near the site. Large areas had been cleared for rice cultivation. Scattered along the west side were numerous tents and wooden shacks that were the sign of wood cutters. Several men in small boats were fishing while numerous other unattended lines were hanging in the water from the west bank. I asked Yatno about them and he told me that the rigging was attached to turtle traps.

I did not have to be told that we had reached the mining site, the evidence was obvious. The river here was a dirty brown color with an oily sheen on its surface. There were numerous drums of gasoline lying about. Some were full of fuel, others were empty and waiting to be taken back to Kumai. A small village had sprung up around the mine. The houses looked like they were hastily slapped together, although a few had satellite dishes for television. The one TV I saw had reruns of an American game show on. For some reason, such programs are popular throughout Indonesia. Riksa told me that over fifty families live in the settlement here. Numerous chickens and a few scrawny dogs were drifting about searching for food scraps among the trash filled dirt gutters.

Several hundred acres of trees had been cleared from the dense forest to make way for the newly arrived people. While some had been cleared for the settlement, most had been removed for the mining operation. If one could ignore the environmental destruction, poverty, and back breaking work life of the miners; the entire gold mining process is fascinating. The forest is leveled and the thin topsoil cleared so that the sand layer underneath can be worked. The gold is scattered in tiny flakes throughout the sand, so the next task is getting the gold separated from the granules. The better equipped miners use gasoline powered water hoses to turn masses of sand into a watery gruel. The slurry is then pumped through more hoses up to a sluice. As the water/sand mixture



moves down the sluice, the heavy weight of the gold flakes causes them to stick to cloth screening that covers the bottom of the apparatus.

The small-time operators, usually a miner and his immediate family, duplicate this process by hand. These people will work the pits that have been left by the mechanized groups. Instead of gas-driven pumps they painstakingly shovel the sand onto their smaller sluice and pour buckets of water over the sand until it is washed away and the gold adheres to the screen. Riksa told me that the small operators will move on to a new pit once their daily income drops to less than \$10 (US) a day. It is dirty and dangerous work because the older pits are more likely to collapse and can bury and smother the miner.

The next step is to remove the flakes of gold as cheaply, effectively, and quickly as possible. Unfortunately, liquid mercury serves this purpose well. The fluid is poured down the screening and the gold washes down and clumps together. Mercury is one of the most toxic substances known, and exposure to even small amounts can be very harmful or even fatal to a human. The amount of mercury used is not only poisoning the miners who work with it, but also their families. When the heavy rains come, the mining pits get filled with water, and this mercury-contaminated water gets washed out into the Sekonyer River. The fish in the river, and the reptiles, birds, and humans who eat those fish downstream from the mine, are now carrying this toxin in their systems.

After visiting the gold mine, we traveled down river to Natai Lengkuas. As soon as the kelotok docked, Yatno washed the boat down. He told me that he wanted to remove the stains resulting from our short visit to the mine. Riksa introduced me to the three rangers stationed at Natai. One of them led us into the forest, but there was little wildlife about. We heard a lesser mouse deer move ahead of us and the ranger showed us a half-dozen short-nosed fruit bats that nested everyday in a tourist shelter. Reptiles were more visible, there were lots of geckos, small lizards, and a larger lizard which I believe is called the Borneo blood sucker. Riksa told me the Dayaks believe this animal is evil and can cause harm to humans, no doubt the reason for its horrible name. One of the huts used by the rangers had a sign in English warning that a cobra sometimes makes its residence there. Next to the ranger post was a thirty foot high observation tower. It gave an excellent view of the canopy and I spent several hours each day birding from the top. That evening I spotted a large flying fox sailing carefree through the deep indigo night sky.

Riksa arranged for an early walk the next morning to look for gibbons and red leaf monkeys. Like the previous day, I was awakened early by the calls of gibbons. They continued their vocalizations throughout the morning, enabling the ranger to lead Riksa and I toward the sound. We were in the forest for fifteen minutes when I heard a loud scratching noise. Riksa asked the ranger for the source of the noise, and he told us it was the clawing of a sunbear digging into a tree looking for honey. There were warnings posted at the station advising visitors to avoid the bears. Evidently they are unpredictable and often attack when approached by an unwary visitor. I knew that asking the ranger to lead us to the sound was out of the question, so we pushed on.

Within a few minutes the ranger stopped and pointed upwards. Riksa said that he found a red monkey. I could barely make the animal out with my eyes, since it sat motionless at the top of a tree sixty feet above our heads. It's striking, bright reddish color made it an attractive creature. I had to use my binoculars to get a decent view, and was amazed that the ranger had even seen it. I did read later, however, that the red leaf

monkey gives off a low whistle when humans pass by them. The ranger must have picked up the sound as he walked by and looked up to spot the langur.

The agile gibbons were still calling so, within a half hour of the start of our walk, we found them. There were three and they were not very pleased to see us. They moved off quickly, swinging effortlessly through the trees. I do not think that anyone can get a real appreciation of how athletic and graceful gibbons are until you see them brachiate through a forest. They reminded me of a trapeze artist in a circus.

We headed back to the station. After breakfast, I climbed the tower and identified some more colorful birds; green imperial and pink-necked pigeon, large green and cinnamon-headed green pigeon, black headed and yellow-vented flowerpecker, black eagle, brahminy kite, long-tailed parakeet, hill myna, and mangrove blue flycatcher. In the afternoon a group of long-tailed macaques moved into the trees around the platform and I got to watch them at my leisure.

An evening walk turned up a black partridge and three small squirrels which I was never really able to identify. They could have been any of five species of smaller tree squirrels that are found in the park. Twice, at 11:00 AM and at 1:00 PM, I heard the long call of a male orangutan. Unfortunately at various times throughout the day, I also heard the harsh buzz of gas-powered chain saws. A few times I heard the distinct crash/slam sound of a large tree that had just been cut down in the forest across the river. The forest on the west bank of the Sekonyer is indeed disappearing quickly.

The next day, after another early morning walk in the forest, we set off slowly down river. We revisited ranger Rudi at Pondor Tanggul. A walk in the forest produced a bearded pig, a lone male proboscis monkey, a group of macaques, and a wild male orang. This guy was twenty feet up in a fruit tree. The golden colored fruits were scattered about the base of the tree. Riksa gathered some whole, ripe fruits and took them back to the boat. That evening for dinner she served them with salt and chile and, with a broad smile, said that they were a Dayak appetizer. I found them tart but very tasty.

By 2:00 PM we were drawing close to Tanjung Harapan. The Proboscis monkeys and long-tailed macaques were gathering in the trees along both sides of the river. Again I marveled at the concentration of animals. Yatno also spotted another wild orang. As we hugged the west bank, I suddenly saw a monkey that was not a macaque. I had Yatno back up the kelotok to get clearer look. With my binoculars, I saw that I had spotted a group of silver langurs, a species seen infrequently along the Sekonyer. Riksa had never seen them before, and Yatno had only seen them on a few rare occasions. It was a good sighting. Later, we stopped at the Rimba tourist lodge to see a small group of prevost squirrels which live next to the facility.

I was too busy monkey watching to really concentrate on birds, but I did note oriental darter, white-bellied sea-eagle, blue-throated bee-eater, white-breasted water hen, pied fantail, long-tailed parakeet, barn swallow, and blue-eared kingfisher. We also saw a Borneo river turtle which had managed somehow to avoid the gauntlet of turtle traps lining the west bank of the Sekonyer.

We spent my last night in Kalimantan just down river from Tanjung Harapan. I did not draw any river water for my bath from this section of the river, since we had tied up next to a village and the water was trash-filled and dirty. I managed to get a complete bath from a small bucket of clean water that we had drawn further upstream. Several times



that night I was awakened by the screeches, grunts, and barks of a group of proboscis monkeys brawling on the other side of the river.

Gibbon calls again provided my morning alarm. We motored across the Sekonyer to revisit the young orangs Gustav, Winnie, and Jackie at Harapan. Riksa said that we had time for a short walk in the forest before I had to head back down river to Kumai and the airport. The orangs were as active as usual, and one of the adults even attempted to steal the backpack of a female tourist. We saw storm storks, a bat hawk, and a rufous piculet, which is a very small woodpecker. I also found an all black, red bellied prevost squirrel which leaped twenty feet out of a tree to the ground when it saw us.

Reluctantly I had to return to the Garuda. I would take the Kelotok to Kumai, a taxi to Pangkajene airport, then board a plane to Semarang Java, and finally a jet to my ultimate destination that day- Jakarta.

What a beautiful park and what an incredible concentration of wildlife. But how long can Tanjung Puting survive? The reserve seems secure for the present and certainly Dr. Galdikas's presence and the status she gives Tanjung Puting will help protect the forest into the near future.

But what about the long-term future of the reserve? Something that I saw on my last day on the Sekonyer haunts me still. On our voyage back to Kumai, we passed several logger camps while traveling down river. The woodcutters at each camp were binding together freshly cut timber to form rafts that would be floated downstream. These rafts of logs will reach Kumai and be loaded on to phinisi schooners which eventually dock at Jakarta. It is here that the wood will be processed into plywood and paper. How long will it be before the loggers have completely stripped the west bank of the Sekonyer of trees? And then will their eyes turn full of greed and send them towards the forests of Tanjung Puting, which sits across the river just a short distance to the east?

## Dickerson Park Records Chilean Flamingo Hatch

**Dickerson Park Zoo (Springfield,MO) announces the hatching of four Chilean flamingos (*Phoenicopterus chilensis*). Three of the chicks survived and are in apparent good health. This marks the first successful hatching of this species at the Zoo. The flock of 16 birds laid a total of 11 eggs this season, 10 of which were fertile. The chicks are currently being parent-reared.**

*submitted by Melinda Arnold, Dickerson Park  
Zoo Marketing/PR coordinator*

*Photo courtesy of Dickerson Park Zoo*



*Institutions wishing to advertise employment opportunities are asked to send pertinent data by **the 10th of each month** to: Opportunity Knocks/AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing date for positions available and when setting these dates keep in mind that because of bulk-mail, most readers do not receive the AKF until the middle of the month or later. There is no charge for this service and phone-in or fax listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is (913) 273-1980.*

**ELEPHANT KEEPER**...the position requires at least three (3) year's experience working with elephants in free contact. Responsibilities include the care and daily maintenance of two young female African elephants, as well as other hoofed animals. Must be able to run elephant rides and do demonstrations for the public. Send resumé to: Natural Bridge Zoo, P. O. Box 88, Natural Bridge, VA 24578 or fax (540) 291-1891.

***The following three (3) positions are available at the Kansas City Zoological Gardens, Kansas City, MO. Nonresidents, if appointed, must establish residency within Kansas City, MO city limits. Kansas City, MO is an equal opportunity employer committed to a diverse work force. Pre-employment drug screen required. For any of the positions submit resumé by 6 December 1996 to: Human Resources Dept., City Hall, 414 E. 12th St., Kansas City, MO 64106.***

**VETERINARIAN TECHNICIAN**...successful applicant must be a graduate of an AVMA accredited veterinary technology program and have two year's experience as a veterinarian technician preferably working with exotic animals. Internship hours in exotic animal technology can apply towards experience. Position provides assistance to staff veterinarians and supervises keeper staff in the Animal Health facility. Salary range for position is \$1,918.00 to \$2,683.00 monthly, plus excellent benefits.

**ZOOKEEPER**(to add to existing candidate list)...requires high school diploma and one year experience in the care, feeding and handling of zoo animals. Good communication skills desired. Responsible for daily animal care, exhibit maintenance, animal observations, and public contact. May work with diverse collection. Starting salary \$1,632.00/month with excellent benefits.

**ANIMAL TECHNICIAN/AREA SUPERVISOR**...prefer candidate with an accredited associate degree in life science, two (2) year's experience in zoo animal husbandry and exhibition; supervisory experience in animal-related capacity preferred. Will participate in maintaining and exhibiting a diverse animal collection; development and implementation of programs; and direct supervision of zookeeper staff. Salary range \$1,918.00 to \$2,683.00/month plus excellent benefits.

**ANIMAL KEEPER**...the Heritage Zoo has a full-time position open for a hard-working, well-rounded person who would enjoy working at a small progressive zoo. Responsibilities include the husbandry of a diverse animal collection, maintaining zoo exhibits and animal record keeping. One year paid zoo experience required. Starting salary is \$6.00/hr. plus benefits. Send resumé



by 1 December 1996 to: Dale J. Bakken, Executive Director, Heritage Zoo, 2103 West Stolley Park Road, Grand Island, NE 68801-6941.

*The following two (2) positions are available at the Cohanzick Zoo. Send letter, resumé and references by 15 December 1996 to: Jay R. Christie, Cohanzick Zoo, 181 E. Commerce St., Bridgeton, NJ 08302.*

**ANIMAL KEEPER**...requires one year of experience in the care and feeding of non-domesticated animals in a zoo or similar setting. Preference will be given to candidates possessing a bachelor's or associate's degree. Requires a proactive, positive work attitude. The Cohanzick Zoo is a rapidly expanding facility that specializes in the wildlife of Asia and South America. The successful candidate will be involved in all facets of animal care as well as zoo maintenance and improvements, record keeping, animal demonstrations, behavioral enrichment, and promoting zoo safety. Competitive salary with excellent benefits.

**SUPERVISING ANIMAL KEEPER**...requires four years of experience in the care, handling, and feeding of mammals, birds, reptiles and amphibians. Strong preference will be given to those candidates possessing a relevant degree. Will perform all duties required of animal keepers (see above) as well as supervising assigned personnel, staff and animal training, report preparation and other zoo management tasks assigned by the Curator. Competitive salary with excellent benefits and opportunities for advancement.

**SENIOR KEEPER/Riverside Zoo**...requires three years experience in the zoo field, with prior supervisory experience. Will provide professional guidance to a keeper staff of 8+, as well as assist in collection management and planning, maintenance of animal facilities, keeper training, daily animal husbandry, ARKS, MedARKS, volunteer training, strategic planning, and research project management. **Closing date is 13 December 1996.** Application, community profile and detailed position description available from City of Scottsbluff Personnel Office, 1818 Ave. A, Scottsbluff, NE 69361 or (308) 632-4136. EOE.

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## **Information Please....**

Does anyone have any information on the performance of the "Roarhide"® rawhide chew by Nylabone? Please contact: Vicki Ferren, Fort Wayne Children's Zoo, 3411 Sherman Blvd., Fort Wayne, IN 46808.

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# ANIMAL KEEPERS' FORUM

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The Journal of the American  
Association of Zoo Keepers, Inc.

**DECEMBER 1996**



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**Zoo Infant Development Project** - Teri Maas-Anger/Maggie Liguori, Philadelphia Zoo (Birds/Nonpasserines); Jennifer Hackshaw, Lowry Park Zoo and Suzanne Chacon, Costa Rica (Birds/passerines); Jeanne Stevens, Newark Museum Mini-Zoo (Reptiles); Linelle Lone, Denver Zoo (Amphibians)

**Incubation Notebook Project** - Scott Tidmus, Sedgewick County Zoo, Wichita, KS



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## About the Cover....

This month's cover features the Eastern Tiger Swallowtail (*Papilio glaucus*) drawn by Simon Hackshaw of Tampa, FL. From the order Lepidoptera, this male of the species is yellow and black with broad forewing 'tiger' stripes and a single tail on each hindwing. Females are similarly banded, but are dimorphic; one yellow and one black form. Shadows of stripes can still be seen on the black female morph. Both sexes have varying degrees of blue iridescence and orange spots on the hindwing edges. This butterfly ranges in Eastern North America in deciduous, broadleaf forest edges and river valleys, and takes flight in the spring. The solitary feeding caterpillars are 2 1/2 inches, green in color and have yellow eyespots with black centers, orange and black bands and blue dots. They feed on wild cherry, birch, poplar, ash, tulip trees and sweet bay. Thanks, Simon!

## Information for Contributors

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Articles may be submitted on disk by arrangement with the Editor. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy finish black and white photos **only are accepted**. Color slides should be converted to black and white prints (minimum size 3" x 5" [8cm x 14cm]) before submission. Clearly marked captions should accompany photos. Please list photo credit on back of photo.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

**Deadline for each regular issue is the 10th of the preceding month. Dedicated issues may have separate deadline dates and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the AKF staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$3.00 each.

# Message From the President

Greetings from the Lone Star State! Well, another Conference has come and gone. On behalf of the Board of Directors and the membership of the American Association of Zoo Keepers, I would like to thank Michelle Seldon-Koch , Kevin Koch and the members of the Detroit AAZK Chapter for a job well done. A special thanks goes out to Detroit Zoological Institute Director Ron Kagan, the Detroit Zoological Institute, and all the volunteers and docents for their hospitality.

Our Association made some very important decisions during this meeting which will alter its future. First and foremost that will affect each and every one of us is the increase in membership fees across the board. The American Association of Zoo Keepers, Inc. is a growing organization. As the organization grows to meet the needs of the membership, the expenses to operate rises also. AAZK membership fees have not seen an increase since 1989. The Board of Directors initiated a membership drive at the beginning of the year. This was an attempt to increase revenue and keep fees from increasing. The AAZK Membership Drive brought in 146 new members. This was far short of the goal.


The main question facing the Board at this meeting was: "What do you do with an organization that raises more than \$100,000 a year for rhinos, and its Chapters maintain more than \$250,000 in local accounts while the parent organization is just getting by in paying bills?" How did we get here you ask? It did not happen overnight but has been a progressive, long-standing trend. AAZK's annual expenses are approximately \$111,000. The largest portion of this goes to the printing of the *Animal Keepers' Forum*, staff wages (Executive Director, Administrative Secretary, AKF Editor, part-time office assistant) and taxes (federal withholding, sales). The Board of Directors spent a lot of time analyzing this situation and made these immediate recommendations: \*to freeze staff wages \*to suspend the mid-year Board of Directors meeting \*to eliminate travel to the AZA Regional Conference by the Immediate Past President/AZA Liaison \*to suspend publications \*to restrict the 800 number to office hours \*to limit the cost of production of the AKF to a \$3000 per month maximum. With the increase of membership fees and the implementation of these recommendations, we should ease the financial bleeding slowly.

As members of the American Association of Zoo Keepers, each one of us should take this personally. Without AAZK, all 75 Chapters do not exist. Individuals and Chapters should make this a personal challenge. One dedicated member has done just that. After returning from Detroit, Jeannette Beranger, Roger Williams Park Zoo, Providence, RI, and a few friends raised \$300 by hosting a photo workshop. She would like to challenge individuals and/or Chapters to do the same - to beat or meet her pledge.

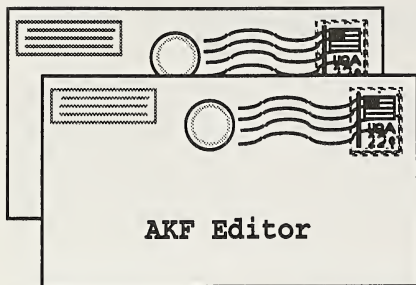
This is your professional organization. What you do can make a difference. AAZK is committed to raising the standards of quality animal care in all aspects of the profession. We have a commitment to conservation and education, while continuing to provide the latest information on husbandry and enrichment to the membership. Your Association is looking to you for help.

From the site of the 1997 AAZK National Conference.

Ric Urban  
President, AAZK, Inc.  
Houston Zoological Gardens







## Letters to the Editor

*Members are welcome to submit Letters to the Editor concerning material appearing in AKF or on matters relating to the Association.*

Greetings from Rhode Island!

Enclosed is a check from a fundraiser I put together for the AAZK this past weekend. With the help of my husband and a couple of friends, we raised \$300.00 by holding a photo workshop here at the zoo. I know it's not much, but I feel better knowing I could do something.

As a former Regional Coordinator and being active on the national level, I know all too well that there is an increasing need of financial support aside from the membership dues. I would like to challenge all Chapters to at least match the \$300.00 I've raised. Everyone should help support the national organization whose name is used for their own local fundraising.

The following people helped with the photo workshop:

Steve Walker - professional zoo photographer who taught this class; Tom Troy and Marge Macallister, zookeepers who gave behind-the-scenes tours; Frederic Beranger who prepared dinner for the participants; and Tony Vecchio, Director of the Roger Williams Park Zoo, who allowed us to do this on zoo grounds.

In closing I hope at least a few Chapters get encouraged to help so we can turn the initial \$300.00 into much more.

Sincerely,

Jeannette Beranger  
Roger Williams Park Zoo, Providence, RI

## **Animal Behavior Concerns & Solutions**

A Question and Answer Forum for the Zoo Professional

By Diana Guerrero

Independent Behavior Consultant, Ark Animals of California, San Diego, CA

### **Nursery Behavior Necessities**

#### **Zoo, Nursery & Children's Zoo String: Canids**

##### **QUESTION**

There have been numerous problems associated with hand-reared babies in Zoological Gardens. These include not only human orientation or imprinting but higher instances of aggression to keeper staff, animal ambassadors going awry, and difficulties in integration with others of the same species. Can you address this topic?

**NOTE:** Since this is a very complex topic, the next several columns will deal with this issue. If you have specific tips or questions please direct them to AAZK or e-mail ARK direct at [arkabc@ix.netcom.com](mailto:arkabc@ix.netcom.com) for inclusion in this series.

##### **BACKGROUND**

Please see Volume 23, No. 10, 1996

##### **PROBLEM**

Please see Volumes 23, No. 10, 1996; No.11, 1996

In adding to previous comments regarding problems faced in captive rearing, it is especially important to note the importance of grouping animals with their conspecifics. Animals raised with others of the same species or with substitute species with similar traits can be critical to developing a stable individual. This is especially true of pack animals or highly social species such as wolves or coyotes.

##### **ANIMAL PROFILE: CANIDS**

Predatory animals are always a handful, especially as they grow and become more active. Cute little cubs can turn into fear aggressive animals. Some canids are highly social, others are not. They usually grow up in litters and learn many of their behavior skills in them. Hand-rearing challenges with these species can mold an animal into a workable adult or an animal that is not so amiable to work with.

Social structure is important in canids, especially wolves. Hand-rearing must accomplish several things from an early age so that later in life the animal remains more stable and more flexible with new staff. This is difficult, at best,



with the current trends of personnel transfer and changes. Wolf hierarchy and structure depends on intricate knowledge of the individuals and their rapport within the pack and a long established trust bond. Integration with humans takes at least a year or more (Klinghammer, Goodman, 1985).

## **PROBLEM BREAKDOWN**

Private institutions or research facilities often provide the most insight and strategies to deal with captive wild animals because they deal with behavior or such research on a daily basis. Without practical background or information on this topic it is hard to know what the right thing is to do. Although the breeding behavior of many animals has been studied or documented, other behavior or strategies have not been done in zoos until fairly recently.

There are several concerns which need to be addressed:

- Consistent Rules
- Exposure To New Things
- Greeting & Mouthing Behavior
- Jumping And Other Pawing Behavior
- Curiosity And Food Drive Behaviors
- Desensitization And Distraction
- Behavior Records
- Inadvertent Reinforcement Or Training By Accident
- Nursery Animal Companions

## **CONSISTENT RULES**

Having consistent rules is a very important strategy. It is the one way that you can develop consistency throughout your department and with visitors. The general rule is to teach the animal as a cub those rules which will make them a desirable adult.

The fewer liberties or mistakes in handling made at a young age by having consistency across staff or human interactions increases the chances of developing a more stable individual later.

## **EXPOSURE TO NEW THINGS**

Creating a confident and curious animal is important. Some animals will be more curious and confident than others. By taking them into new situations and allowing them to explore in controlled and safe surroundings, and by providing controlled interactions you will create a more confident and balanced individual. Leash training will be an important restraint skill to have on the cub; if you train the acceptance of one correctly, life will be that much easier later in life.

Leash training will be covered in another article on Ambassador Animals but an excellent resource on wolves can be found in *The Management & Socialization*

## **GREETING & MOUTHING BEHAVIOR**

This is probably the most important behavior as well as the more annoying one. Once cubs begin to engage in active movement they will want to nip and bite to greet handlers. Care should be taken to allow for this type of greeting behavior without injury to the handler. Limbs should not be pulled away but forms of distraction and replacement objects may be used with this innate behavior which can also be redirected at later stages.

Keepers should wear protective clothing and be aware of this type of behavior early on. Hair, new clothing and other changes in the dress of environment will often trigger investigative or fearful reactions in these cubs. Play can be redirected into other activities through distraction, and use of appendage extenders or replacement items.

Pairing words with teaching behavior is important. These animals are very socialized to humans and more individualized than their conspecifics that are mother raised. When a cub bites too hard, fingers over the muzzle and pushing the lips onto the teeth (mild pressure) can be utilized, and the words "be gentle" or "be easy" can be verbalized with the action; this can teach the youngster to be more gentle. Not pulling away is also important to minimize conditioning and not trigger any head shaking or more violent biting behavior.

Care should be taken to avoid playing with these animals as domestic puppies. This energy should be redirected into other types of play with litter-mates or a domestic dog. There is a need for active play and "rough and tumble" activity, however it ideally should not involve the keeper. Substituting toys, things to chase and playmates are ideal substitutes instead.

Biting can evolve into a big problem for obvious reasons. Redirection to other objects is desirable. The easiest way is to redirect their mouth away after their greeting and distract them into something else. Play biting is not acceptable on a human at any time!

When working with animals, not reacting often has a good effect on young playful animals in low levels of excitement. A stronger response from their mother (growl or snarl) causes them to naturally stop but stern eye contact can be used if applied correctly. Distraction can then be used by the handler to redirect this and is the best way to deal with it. Some animals with stronger personalities or wills find this fun! Discernment in knowing the difference on how to handle these "handfuls" is a critical skill in nursery staff.

Canids are often very ritualistic when dealing with one another. They will use posturing and growling, eye contact and other cues to signal a warning. They never hit one another and to strike a canine is inappropriate. The intricacies of raising wolves has been dealt with pretty thoroughly (Klinghammer Goodman, 1985) with all the related concerns and possibilities touched. Courses on



handling from Wolf Park in Indiana would be a recommended course of study for anyone committed to working with wolves in any capacity.

Another strategy, also from the old school, is to create a gagging reflex when they bite. This activity has associated risks and is not recommended. If used, most handlers only do so when the cubs are very, very young or in emergencies. Also, it should only be used in non-greeting types of aggressive interactions.

The best method is preventative and started young! Also, low level restraint by grabbing the back of the neck and relocating a cub or giving them a time-out or opportunities to release the energy elsewhere is the ideal strategy. Care must be taken to not inadvertently reinforce the behavior.

If the cub is older and testing the limits, sometimes they will continue to press the issue and not back off. Your best bet is prevention by watching the behavior patterns and being aware or predicting when this behavior is escalating; handle it before it becomes a problem by putting the cub away, leaving, or redirecting the energy. Some suggest pinning an animal much like a dominant or alpha pack member would discipline them. Concern is to whether or not it would be done correctly and if that behavior would later be attempted from the canid back to a human in a less favorable circumstance later in life.

NOTE: Be careful not to reinforce aggressive or naughty behavior by withdrawing from it once it has developed! You will have to have a strategy to deal with it to see it through completion.

## **JUMPING AND OTHER PAWING BEHAVIOR**

This is another behavior that starts from a very young age. Not turning your back on the cub(s) when exiting and entering an enclosure are important behavior patterns so that you do not trigger the natural instinct to jump and ambush!

Crouching low to the ground when entering to visit the cubs is recommended. This will help prevent them learning to jump up on you to greet you. NEVER knee or step on the back paws of these animals to correct this type of behavior. It is not advantageous to you or the cub. Dog obedience tricks do not work with wild animals.

Again, prevention, pre-planning and early training are important. Also, remember that certain interactions will stir up the activity level. For instance, olfactory stimulation can get a cub wound up; other triggers can be new hair ribbons or hair braids, watches, rings, earrings can get them going.....be prepared to deal with those possibilities. Being a well-endowed female handling these kinds of cubs can also be hazardous, so use care on how you are handling or restraining the cubs.

These cubs, especially coyotes, can bounce and bite quicker than you can imagine. It is best to be prepared and to perhaps use a distraction device like the "bite stick." (Klinghammer 1985)

## **CURIOSITY AND FOOD DRIVE BEHAVIORS**

These will be some of your biggest challenges with this type of animal. Food drive creates such a strong reaction that it is not recommended to be used in training. Meat and high interest items will only get you into trouble. Scratching and other grooming behaviors are good to use as reinforcement.

Curiosity leads to exploration and jumping and grabbing of new and exciting things. Wolves and coyotes seem especially adept at these types of displays. Pre-planning and awareness will keep you out of trouble.

## **STRATEGIES: DESENSITIZATION & DISTRACTION**

These are two very important tools to use when working with any type of animal. Both strategies if used and implemented can develop an animal into a stable controllable ambassador or exhibit animal. When not used, the animal will remain reactive, less predictable, and unworkable compared to their buddies who have had the benefit of such training tools.

Desensitization is teaching an animal to ignore or accept new environmental changes, people, or events with little trauma. The more people, new areas or things the animal is introduced to, the more secure and less reactive or volatile they will be. This is critical for ambassador/show animals! A potential fearful encounter is approached by the human handler first, the handler will encourage the cub to approach and explore (not force), later this object encountered will not create that fear response. Care must be taken to not try and "comfort" the animal in this situation since it can reinforce the fear response.

Distraction is a strategy used to distract the animal away from one activity into another. It is used before the undesired reaction evolves into a behavior. For instance, a play attack is directed into another play activity, or a potential problem is averted by a noise, presentation of another object, etc.

Handling and teaching the cub to accept all types of gentle restraint and inspection is important to allow husbandry control later in life. The more you do with the youngster now the easier they will be to handle and perform Veterinary exams without great trauma later.

## **BEHAVIOR RECORDS**

Oh no, not more work! This is one of the most critical logs you can keep on your animal(s). It can relay critical information to other keepers or trainers down the road. You never know when this type of information will be critical to the well being of another keeper, to other animals or to the individual animal that has left your care.

Noting dislikes, likes, problematic behavior, and strategies used to deal with them are important clues to working with this animal down the road. It can also help decipher problems too. For instance, sex and number of siblings raised with, parent data, how they are raised (alone or siblings), hand raised by men or women or both, exposure to other species and a variety of other



information is important. Details such as when the eyes and ears open, when they first walk, if and when they start to fear strangers, when they were removed from parents, when they were placed with other species, dates they have been isolated, any traumatic behavior experiences or illnesses and injuries are all VERY important behavioral records to have notes on. (See Developmental Record, Klinghammer & Goodman 1985). Without that information the animal can experience difficulties and trauma that could have been prevented had the records been sent with him.

### **INADVERTENT TRAINING**

This is training by accident. If an animal acts aggressive or gets unruly they often get put away or are allowed to engage in whatever they want. So they learn that behaving certain ways will get them what they want! Not a good thing to teach in a captive wild animal!

Cubs moved to a new area for public viewing will react fearfully and retreat or growl at the public. They run to you for protection....do you touch and comfort them? NO! Why? Because you would be reinforcing a fear reaction. Just talk to them and let them sort it out. Soon they will ignore the public and be desensitized to the whole adventure. They should not be left unattended in strange or new situations or with new people.

### **NURSERY ANIMAL COMPANIONS**

Having the same species or different species of the same family can be an advantage in sorting through some of the natural behavior challenges you encounter. Canids can romp, bite, and chew on their litter-mates or playmates and fulfill that natural urge to play and learn behavior etiquette between animals.

Hope these ideas are useful to helping you sort through the behavior challenges of cubs and providing the best conditions for your "children" to develop and learn in. Feel free to send in any additional information you find useful or want to share.

### **OTHER**

Desensitization should include exposure to a wide variety of circumstances and viewing of individuals. Men with facial hair, dark sunglasses, hats, and other items or different looking people is recommended. Care should be taken that the cub does not get to grab or intimidate these newly introduced variables.

Leash work (to be dealt with separately) should be done with light chains and not chewable leashes or collars. "Passing links," "French links," and sturdy "swivels" should be used in constructing a proper leash. If done properly, it is a secure leash which will not kink and that is safe enough to use in most circumstances.

### **ACKNOWLEDGMENTS**

Special Thanks to Wolf Park & Dr. Klinghammer for his input and publications.

The following is a partial list of recommended reading material for this topic:

Goodmann, P.A.; Klinghammer, E. (1985) Wolf Ethogram. Battle Ground, IN: Institute of Ethology, North American Wildlife Park Foundation.

Klinghammer, E., Ed. (1979) The Behavior & Ecology Of Wolves. Garland STPM, New York.

Klinghammer, E. (1992) Applied Ethology: Some Basic Principles of Ethology & Psychology. Battle Ground, IN: Institute of Ethology, North American Wildlife Park Foundation.

Wolf Behavior Seminars will be held May 25-29 1997; August 3-7 1997; & October 5-9 1997. Cost is \$375.00 per person and limited to 25 participants. Fees do not include transportation, lodging, or meals. For further information contact Wolf Park, Battle Ground, IN 47920 USA (317) 567-2265 ; FAX (317)567-4299 or E-mail WOLFPARK@DCWI.COM

*(About the Author: Since 1978 Diana has been active both in the U. S. and England working with zoos, private collections, an oceanarium, a marine aquarium, and other animal-related organizations involving captive wildlife. She has a broad base of animal experience involving movie & television training, zookeeping, show performances with live animals, education, behavior management, modification and enrichment, rescue and rehabilitation as well as captive breeding and management of endangered species. She currently works as an Animal Behavior Consultant and Trainer for Ark Animals of California working with both exotic and domestic animals. She has authored numerous articles on animal behavior and training. If you have questions for Diana, you may contact her at 1-800-818-7387 or visit her Home Page at <http://www.ni.net/brookhouse.com>)*

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## An Update on ZIDP - Passerines

Prior to a mass mailing, the Zoo Infant Development/Passerines Survey is being reviewed and completed by several colleagues to reveal potential problems in how questions on the survey are asked, and to ensure that the data retrieved is what is intended. Additionally, a list of passerines successfully bred at North American zoos over the last eight years is being compiled by the International Species Information Systems (ISIS) so each institution will be asked to complete the survey on only those passerines that they have recently bred. When this is completed, the survey will be mailed and results, pending institution participation, should be available within nine months. The survey has been divided into five sections, ranging from parent reproductive history to hand-rearing information. It is (hopefully) in a user-friendly format that will be an essential database for a variety of information on a wide array of passerines.

Please direct questions regarding the Zoo Infant Development Project/Passerines Survey to: Jennifer Hackshaw, Lowry Park Zoo (813) 935-8552, ext. 229.



# Research Grants Committee Seeks Members

Dear friends and fellow keepers,

At the recent AAZK National Conference, my application for the Chair of the Research Grant Committee was approved. Currently I am in the process of revitalizing this important service of our Association. In order to staff and organize this committee, I am looking for a few good persons with a background and interest in research to join me on this committee to review the grant applications and make recommendations to the Board of Directors for grant approval. AAZK members in good standing who would like to be considered for membership on the Research Grant Committee may send their resumés to me at the address listed below.

AAZK, Inc. has developed the Zoo Keeper Grant in non-invasive research to promote and support keeper and aquarist efforts in behavioral research. The \$750.00 grant is for the benefit of North American zoological keeper-initiated research efforts. It is designed specifically for purchasing equipment, supplies and materials for research projects. The next deadline for applications is **1 March 1997**. AAZK members in good standing who are interested in applying for a grant should direct inquiries to me at the following address:

Farshid Mehrdadfar, Chair	Phone: (503) 226-1561
AAZK Research Grant Committee	
Metro Washington Park Zoo	Fax: (503) 226-0074
4001 S. W. Canyon Rd.	
Portland, OR 97221	E-mail: farshid@interserv.com

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## A Thank You and Two Corrections. . . .

The Docent Council of THE ZOO located in Guld Breeze, FL would like to take this opportunity to thank the staff and animal keepers at THE ZOO for the tremendous support provided during ZOOMANIA - 96. Due to their support the Southeast Regional Docent Conference was a success and the attendees gained a valuable insight into the role that the keepers provide in maintaining the zoo and its animals.  
*submitted by Tom Sutton, Gulf Breeze, FL.*

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In the "Letters to the Editor" section in the October 1996 *AKF* (p. 521), the following corrections need to be made: the author's name is Barre E. Fields, not Barrie; and the correct e-mail address is: bfields@mail.indyzoo.com

In the listing of the recipients of the Jean M. Hromadka Excellence in Zoo Keeping Award (Oct. 1996 *AKF*, pg. 531) Jill Sampson was incorrectly identified as Jim Sampson. Our sincere apologies for these inadvertent errors.



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# 1996 Conference Proceedings Order Information

If you are interested in obtaining a copy of the Proceedings containing the papers presented at the 23rd National AAZK Conference held in Detroit, MI, you will need to fill out and return the form on the next page no later than **31 January 1997**. All orders must be prepaid in U.S. Funds ONLY. Allow 4-6 weeks following deadline for receipt of publication. Prices are as follows:

**AAZK Member \$25.00**

**Non Member \$35.00**

Postage for U.S. orders is included. Canadian and overseas orders should add \$4.00 for Air Mail postage to Canada and Surface postage elsewhere. Overseas orders wishing Air Mail service should add \$10.00. Make checks payable to AAZK, Inc.

**Note:** Individuals who presented papers at the conference **and** submitted a manuscript in time for inclusion in these Proceedings will receive a gratis copy. If a manuscript was **not** submitted, a gratis copy will not be sent, and those individuals will need to order a copy if they want one.

Cost of the Proceedings was **NOT** part of the Conference Registration Fee and delegates wishing a copy will need to order one.

## **The following papers are among those included in the Proceedings:**

Strategies and Action for Field Conservation: Coalition for Reefs and Rainforests ~ The Fund Raising Success Story of Bowling for Rhinos ~ Assisting Field Conservation on a Shoestring Budget: The Metamorphosis of FRAWG ~ Detection and Treatment of a Possible New Disease Syndrome in a Captive Black Rhino ~ A Successful Reintroduction of an Initially Rejected *Pan troglodytes* Newborn to Its Natural Mother ~ The Care and Procedure Involved in Mending a Broken Leg of a Two and a Half-Year-Old Giraffe - a Keeper's Perspective ~ Hippopotamus Training: Implications for Veterinary Care ~ Mustached Tamarins on the Loose ~ Hippopotamus Underwater Behavior and Communication ~ Contraception (workshop) ~ Carnivore Enrichment ~ Inhlovudawana or "Little Elephant": Managing Warthogs Through Operant Conditioning ~ From Rags to "EN" Riches: Turning an Idle Exhibit Into an Enrichment/Browse Garden ~ The Pet Primate Problem: Recognizing the Role of Zoos in the Problem and Its Solution ~ The Making of a Primate Project in the Peruvian Amazon ~ Captive Propagation for Macaw Conservation in Costa Rica ~ Creation of an Age-Diversified Gorilla Group Through Alternative Means ~ Safety First and Always...At the Jackson Zoo ~ Water Conservation: What Zoo Keepers Can Do ~ Exhibit Design for Breeding Fennec Fox (poster) ~ "Coed" Colobus Monkeys at Cheshaw Wild Animal Park (poster) ~ Changes in Slow Loris Husbandry Due to the Birth of an Infant (poster).

These are the papers which had been submitted as of this month's press time. We also plan to include any other papers, workshop summaries and poster session abstracts that become available to us by our publication deadline.

Feel free to photocopy the form on the next page to place your order. Phone orders may be placed at 1-800-242-4519 (U. S.) or 1-800-468-1966 (Canada) when using either a Mastercard or VISA credit card.

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# AAZK Book Sale

Sale price is 20% off list price

<u>Suggested</u>	<u>\$Sale\$</u>	
\$19.95	\$15.95	<b>Antbirds and Ovenbirds - Their Lives and Homes</b> by Alexandra Skutch. The author covers all aspects of these birds lives, including the various species of each family, food and foraging, daily life, voice displays and courtship, nests and incubation, and parental care. 272 pgs., b&w photos
\$60.00	\$48.00	<b>In the Presence of Wolves</b> by Art Wolfe and Gregory Mnamee. A photographic study illuminating the lives and behaviors of wolves, from birth to death, in their few remaining habitats throughout the world. The accompanying text includes legends, essays, fables, folklore, and thoughts on enabling the world's remaining wolf populations to survive. Hardcover, 160 pgs., full-color photos
\$75.00	\$60.00	<b>Mammals of Australia</b> by Ronald Strahan, Editor. From the well-known platypus, koala and kangaroo species to the little known pygmy-possums, bats and carnivorous marsupials this book provides color photographs and a distribution map for each species. The accompanying descriptions summarize habitat, behavior, diet, reproduction, growth and factors that lead to death. Hardcover, 756pgs. full-color photos
\$35.00	\$28.00	<b>Frogs</b> by David Badger. This book includes 120 full-color photos and coverage of 50 species from around the world. Frog lore world-wide is discussed, and there is a chapter on endangered species which examines the decline in certain frog populations and the possible threat this could hold for the world's wildlife. hardcover, 144 pgs., full-color photos
\$29.95	\$23.95	<b>A Dictionary of Scientific Bird Names</b> by James Jobling. Gives derivation and meaning of all valid scientific bird names and discusses the ways in which birds have been named. Hardcover, 272 pgs., line drawings
\$19.95	\$15.95	<b>Skull and Bones</b> by Glenn Searfoss. A guide to the Skeletal Structures and behavior of North American Mammals. Paper, 288 pgs., line drawings

Previously offered books may still be available, some with price increases. **To order:** List the books you want with your name and complete mailing address. Include shipping fee of \$2.00 for the first item and \$1.00 for each additional item. Make checks or money orders payable to "AAZK Book Sale" (US FUNDS ONLY - no cash or CODs please). Postal rates apply for US orders only - call if interested in shipping outside of U. S. Mail to: AAZK Beardsley Zoo Chapter, attn: Gail Rice, 1875 Noble Ave., Bridgeport, CT 06610-1600. Phone: (203) 576-8126.



# **We're Putting Together the World's Most Amazing Zoological Collection.**

**As an Animal Keeper at Disney's Animal Kingdom** you have the ability to join an elite group of conservation minded professionals who are dedicated to building the world's finest zoological park. We are currently looking to hire more than 80 Animal Keepers to join Bruce Read and Rick Barongi as they create a whole new species of theme park opening in Spring of 1998.

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You should have a high school degree or equivalent with work experience. A college degree in biology or related field is strongly preferred. All candidates should send a formatted résumé on white paper by January 31 to: Salaried Casting, XADSAK612, P.O. Box 10090, Lake Buena Vista, FL 32830.

## **Disney's Animal Kingdom will be conducting interviews with Animal Keepers during these Regional Conferences\*:**

March 19 - 22, 1997 Memphis Zoo, Memphis, TN; April 9 - 12, 1997 Phoenix Zoo, Phoenix, AZ;  
May 15 - 18, 1997 Cleveland Metroparks Zoo, Cleveland, OH

**\* Interviews will be conducted only with candidates who have submitted résumés  
and have been scheduled in advance of event.**





# COMPATIBLE CARNIVORES & HERBIVORES

## The Next Step In Mammalian Mixed Species Exhibitory

*By Stephanie Forbes, Lead Keeper Children's Zoo/Birds  
Bert Castro, Curator of Birds/Mammals  
Zoo Atlanta, Atlanta, GA*

### Introduction

As landscape immersion exhibitry continues to evolve, the perception of exhibits as mini-ecosystems has gained popularity within the zoological community. The emphasis on naturalistic habitats has led to the exhibition of compatible species endemic to the same habitat being displayed together. Herbivores are often maintained together, as well as flocks of birds. Recently, mixed species of birds and herbivores have been the rule rather than the exception (Anderson, Shannon 1982). The coexistence of compatible carnivores and herbivores within the same exhibit continues the natural progression of mixed species exhibits. Visitors can gain a better understanding of niche representation and species specific behaviors, seeing inter-species interaction in a natural habitat. The challenge that these exhibits represent to caregivers is being able to manipulate these exhibits so that they provide a stimulating experience for the public, yet maintain a safe environment for the animals. This paper will discuss the management of two compatible (carnivore/herbivore) species of mammals; the Asian small clawed otter (*Aonyx cinereus*) and the Reeve's muntjac (*Muntiacus reevesi*).

### Methods/Discussion

Zoo Atlanta decided to "test the waters" of multi-species exhibitry, housing Asian small clawed otters with Reeve's muntjac. When Zoo Atlanta chose to exhibit small clawed otters, it was decided that an exhibit in the zoo named Exhibit Du Jour would be used, as its proximity to our Sumatran Orangutans would enhance the zoo's Asian zoogeographic theme. The exhibit area was originally designed for Malayan tapir. Traditionally, the exhibit took on the role of showcasing an assortment of species on a revolving basis, providing temporary housing for lion cubs, tiger cubs, black bear cubs, and a variety of avian species. It was at this time that the idea of housing the otters with Reeve's muntjac, a species already exhibited at the zoo, came about. Both are small species that could cohabitate by utilizing different niches.

The 1,200 sq m (13,000 sq. ft.) exhibit area consists of a waterfall and small stream leading to a large gunnite pool. The land mass is tiered into two sections, separated by a retaining wall and is planted with several varieties of trees, shrubs, and grasses. The pool also doubles as the moat and is two meters deep. The perimeter and retaining walls are constructed of gunnite.

Large logs with lots of branches were placed in the exhibit pool to provide an obstacle course for the otters and provide habitat for the live fish which constitute a small portion of the otter's diet. The logs are moved around during the weekly pool cleaning to keep the area new for the otters. Rocks and hollow logs, as well as dead fall and stumps, were added to the land mass to provide hiding places for the otters and greater surface area for foraging and scent marking. River rocks were placed in the pool's inlet to provide foraging opportunities and exercise. Sand was placed in one corner to form a beach for sunbathing. Trees and shrubs were pruned to provide shade and cover for muntjac and otter alike. A resin "log" feeder was provided for the muntjac and prevented the unsightly appearance of the hay manger usually used for their diet. The goal was to provide the animals with a naturalistic exhibit that could be manipulated by staff to reflect the ever-changing flux found in ecosystems, a principal first pioneered by Hediger who advocated the importance of "...a fresh artificial cycle..." (Hediger, 1950).

It was decided not to shift the muntjac into the holding building at night for fear of overstressing them. A plywood shed was built into the keeper access area with a guillotine door which would be closed during the day to deny otter access. The facade of the shed was attached to a wooden wall in order to conceal it from public view. A door for keeper access was installed to hide the door to the holding building. A 24 cm (9.5") PVC pipe was used for the otter shifting tunnel from exhibit space to holding, as the otters are shifted inside each evening. This allows keepers to more closely observe the otters for health purposes.

Holding for the exhibit is a six sq.m. building with caging along each side of a central keeper access path. Shifting doors between holding and exhibit areas are guillotine style. All indoor caging has a concrete base and 1.5 m (4' 11") pools with chain link extending from cinder block walls to form animal areas. Otter holding consists of a wooden shed for sleeping, the 1.5 m pool, seating platforms for operant conditioning, hollow logs and dead fall to increase surface area for exploration. Sod is routinely placed in holding for otters to dig through in search of treats.

After a routine 30-day quarantine period, the three male Asian small clawed otters were introduced and habituated to the exhibit. They were given one month to adjust to their new surroundings. On 23 August 1995 the otters were removed to the holding facility to allow for the placement of the male muntjac into the exhibit the following day. A one week adjustment period was given to the male muntjac, during which normal species-specific behavior was observed.

It was decided to introduce the male muntjac to the otters prior to bringing the female muntjac onto the area. The rationale behind this decision was that the male muntjac could demonstrate a stronger defense toward the otters, who were presumed to be the more aggressive of the two species. This introduction would determine the success of the co-exhibition of the two species.

The introduction took place on 31 August 1995 and occurred prior to the zoo's



opening. Six staff members were on site at strategic vantage points around the exhibit. Capture equipment and water hoses were on line in case emergency separation of animals was required.

When shifted onto exhibit, the otters' behavior reflected trueness to the niche they established during their first exposure to the exhibit. They expressed no overt interest in the male muntjac. However, the muntjac was quite aware of the otters and met them with aggression whenever they approached his territory. Aggressive behavior was demonstrated by charging and butting the otters. The otters' response was to retreat to the water. After several encounters of this nature, the otters, though curious, kept a respectful distance of the muntjac. A keeper watch was set up to monitor muntjac-otter interactions for one week. No noteworthy aggression by either species was observed. The otters and muntjac quickly became use to one another and their daily routines. At this time it was considered safe to introduce the female muntjac.

Due to the previous success of the initial introduction of the two species, a more aggressive approach was adopted in the plan to integrate the female muntjac into the exhibit. The otters were brought into holding on 6 September 1995 and the female muntjac was released onto exhibit. One day was all that was necessary for the muntjac pair to re-establish their bond and for the female to exhibit normal species-specific behavior. The following day, the otters were allowed access to the exhibit and no aggression was observed. The otters and muntjac maintained the niche boundaries originally set by the male muntjac. The dynamics of the exhibit have changed very little with regard to niche occupancy. The muntjac are still enjoying their dominant status in the exhibit and have successfully reared one offspring.

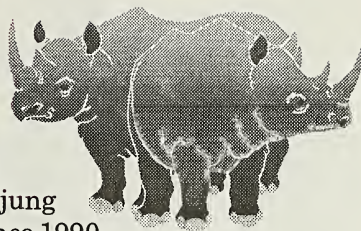
Mixed species exhibitry of this nature seems to carry a strong attraction to visitors and staff alike. Visitors have expressed an appreciation of seeing animals interact with non-conspecifics and, while no quantitative data have been taken, seem to spend more time at the exhibit. Staff appreciate the challenges of working with multi-species exhibits and have also implemented an operant conditioning program with the otters. Overall the exhibit has had an extremely positive effect on our zoo.

## References

- Anderson, D., Shannon, P. 1982. "Birds In Mixed Species Exhibits." AAZPA 1982 Annual Proceedings. pp. 244-250.
- Hediger, H. 1950. Wild Animals In Captivity. London, Butterworths.

# ***Bowling for Rhinos***

## ***1996 Results***



As of 28 October, BFR had raised over \$147,000.00. The first \$100,000.00 will go to Lewa Wildlife Conservancy and the excess will go to Ujung Kulon National Park in Java, Indonesia in 1997. Since 1990, BFR has raised over \$847,000.00! Let's try to break the \$1 million mark in 1997!

Nineteen-hundred and ninety-seven brings about another exciting expansion of funding for BFR. A proposal was submitted and approved at the National AAZK Conference to begin the funding for Sumatran rhino conservation. Funds over \$100,000.00 will now be split between Ujung Kulon and Bukit Barisan Selatan National Park (BBSNP) in southwestern Sumatra. BBSNP is believed to have one of the largest populations of Sumatran rhinos. It is a 3,568 sq. km protected area with rhino, Asian elephant, tiger, clouded leopard, Malayan sun bear and Indian wild dogs - just to name a few. A budget of \$25,000.00 a year is needed at BBSNP to provide additional patrol stations, patrol equipment and training of park rangers in anti-poaching skills.

If anyone still has 1996 BFR monies, please send them **ASAP** to have them included in the 1996 totals. **Send to: Patty Pearthree, P.O. Box 199026, Indianapolis, IN 46219-9026.**

Now is the time to start thinking about your 1997 events, form a committee and get rolling! If you have any questions, please call me at (317) 322-8723 or e-mail at [ppear3@aazk.ind.net](mailto:ppear3@aazk.ind.net)

### **BFR 1996 Top Money Raisers**

1. Bill Nelson - Dallas Zoo - \$5,670.00 - Wins trip to Lewa Wildlife Conservancy - Kenya
2. Jay Weston - Hogle Zoo - \$3,498.00 - Wins trip to Lewa Wildlife Conservancy - Kenya
3. Judyth Lessee - "Really Rhinos" - \$3157.00 - Wins rhino statue
4. Jennifer Howard - Indianapolis Zoo - \$2,568.00
5. Christine McKnight - Minnesota Zoo - \$2,290.00
6. Lois Johannes - San Diego Zoo Event (LA AAZK) - \$2,260.00
7. Delora Batchelor - Miami Metro Zoo - \$2,253.00
8. Janet Wiard - Oklahoma City Zoo - \$2,420.00
9. Farshid Mehrdadfar - Metro Washington Park Zoo - \$1,822.00
10. Tommy Carlson - San Antonio Zoo - \$1,781.98

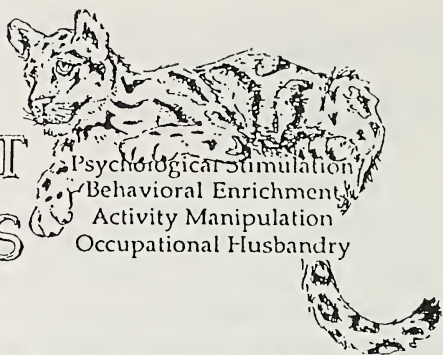
### **Top Money Raising Chapters**

1. Dallas Zoo AAZK - \$14,757.36
2. Metro Washington Park Zoo (Portland AAZK) - \$12,393.40
3. Lincoln Park AAZK - \$10,506.25





# ENRICHMENT OPTIONS



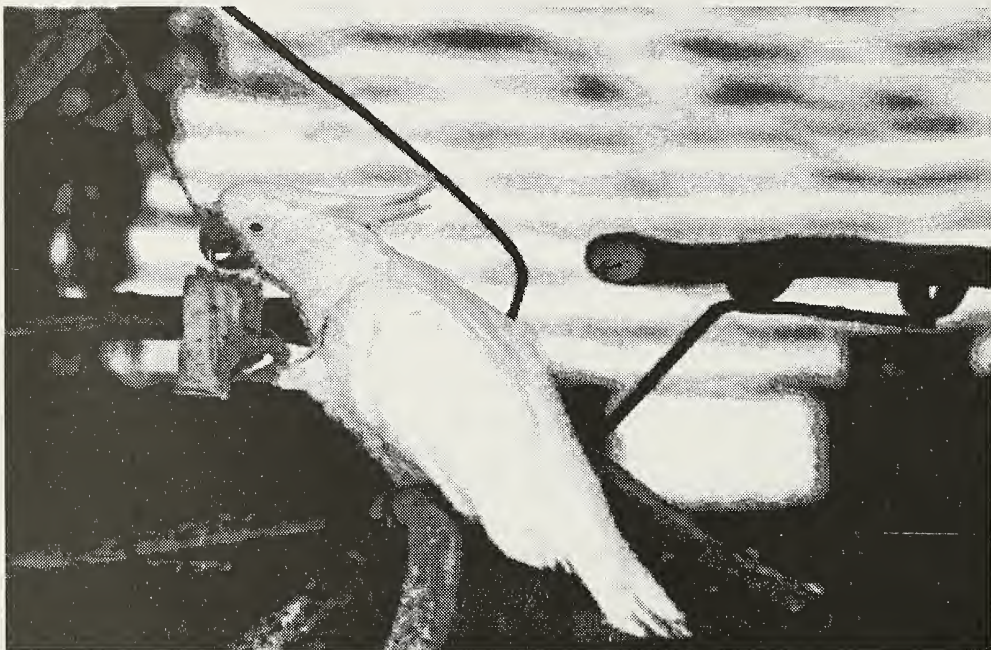
Psychological Stimulation  
Behavioral Enrichment  
Activity Manipulation  
Occupational Husbandry

*By Kayla Grams, Arizona-Sonora Desert Museum  
and Gretchen Ziegler, Sequoia Park Zoo*

I would like to note that the policy of our zoo allows keepers to use non-natural items for enrichment in the animal's displays. As some zoos do not allow this, perhaps these ideas can be implemented in night quarters or off-exhibit areas.

We hung a pair of blue jeans from a tree branch in our capuchin monkey display. We had determined previously that these two particular primates were very unlikely to chew or eat the material or rivets in the pants. We randomly place New World Primate Chow, sunflower seeds, snake sheds, feathers or other dry items in the pockets and rolled up cuffs of the pants. Both primates quickly learned to search the pockets, etc. Moving or rearranging the jeans without placing treats in them also stimulates their activity with them.

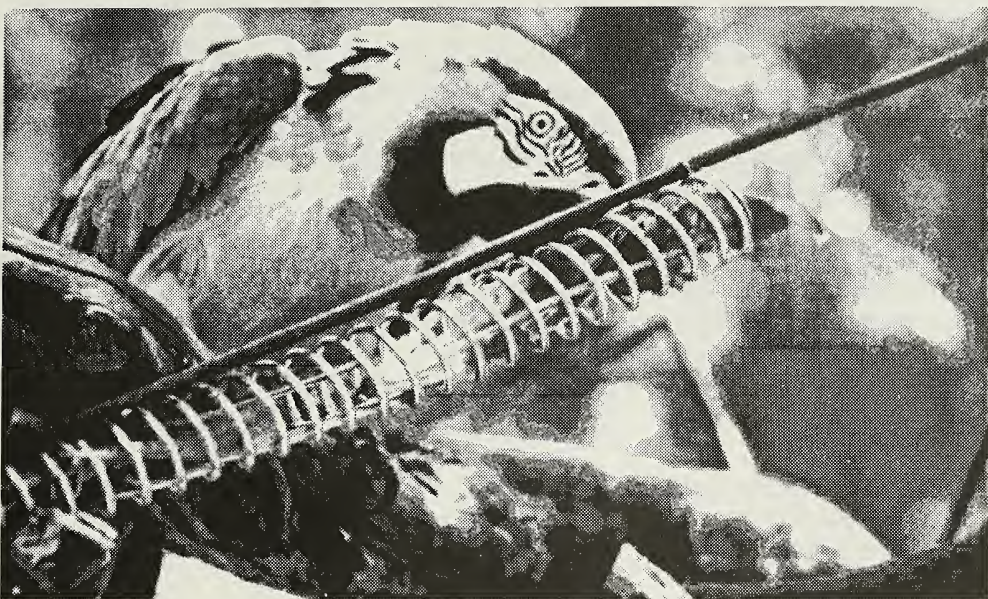
For parrots, an old idea, but it still works: rawhide pieces suspended from a cord for chewing. These are placed randomly both on exhibit and in the nighthouses.



**Rawhide pieces provide good chewing opportunities for psittacines.**



We also took a 16-inch drip tray from a terra cotta planter, drilled 4 holes around the edges and suspended it from chains. Add some water and this provides a fairly large dish for bathing on hot days. So far, some of the parrots still prefer a small four-inch water dish.



**Leafy greens are put inside steel hose guards.**

Stainless steel hose guards (the coiled wire kind) mounted to perches make good feeders to increase the birds' intake of dark, leafy greens like spinach, bok choy or kale. Any item pushed all the way into the spring must be picked out in between the coils. We have not yet tried this with our primates, but it might work for monkeys and lemurs as well. We hung one coil from a chain with a loop at the end so that it may be moved around to different perches.

*--Heather Walsh, Senior Keeper  
Happy Hollow Zoo, San Jose, CA*

**PRIMATES** - a favorite treat with our pigtail and bonnet macaques is a plastic, one-gallon milk jug with a frozen banana inside. This simple and inexpensive item will often keep the macaques interest for a full day. Shaking the jug is not enough to get the treats out. The monkeys must keep the milk jug upside down and work the fruit out with their fingers. Other fruits, such as frozen strawberries, apple pieces and other large pieces of fruit may be used in the place of bananas.

*--Whitney Taylor, Colony Manager and  
Wendy David, Enrichment Assistant  
University of Colorado Primate Lab, Denver, CO*



# Enrichment Survey Request

Dear Keepers,

Enrichment of captive animals is often suggested as a tool for improving the well-being of the animals in our care. Yet, little information exists on how much and what type of enrichment is actually being accomplished. Further, many keepers have raised the issue of various limitations to successfully implementing enrichment for their animals.

The Enrichment Questionnaire (pull-out insert in this issue of *AKF*) was designed to survey keepers to assess the current amount, type, interest, and limitations of enrichment in North American zoos and aquaria. The questionnaire will help the AAZK Enrichment Committee, *The Shape of Enrichment* editors, and other interested persons to determine future enrichment-related projects and services for keepers.

Please complete the questionnaire at your earliest convenience and return it **by 31 January 1997** to: Enrichment Questionnaire, *The Shape of Enrichment*, 1650 Minden Dr., San Diego, CA 92111.

Thank you for your assistance.

*Dianna Frisch, Kathy Wallace, Dana LeBlanc, and Valerie Hare*

---

## REAL MAMMALS FLY !

The AZA Chiropteran Taxon Advisory Group is selling t-shirts for the upcoming holidays featuring the TAG's bat logo on a beige 100% cotton recycled shirt. We also have available our white t-shirts featuring fruit bats flying out of a forest canopy. All shirts are \$15.00 which includes postage/handling. All proceeds go to the TAG's education, research, and nutrition projects. Please make check or money order payable to AZA Chiropteran TAG and send orders to: Kim Tropea, Mammal Dept., Wildlife Conservation Park Bronx, 185th & Southern Blvd., Bronx, NY 10460, or call (718) 220-5046. Be sure to specify desired size.



# Enrichment Questionnaire

If you have already participated in this survey via a recent AAZK Chapter meeting, please do not return this questionnaire.

State or Province of your Institution \_\_\_\_\_ Date \_\_\_\_\_

Please select the single most appropriate option. Add any comments which you feel will benefit us in our attempts to evaluate the "state" of enrichment. Use additional paper if necessary.

1. What percentage of animals in your area are given enrichment at least twice per week? 0% \_\_\_\_\_ 25% \_\_\_\_\_ 50% \_\_\_\_\_  
75% \_\_\_\_\_ 100% \_\_\_\_\_

2. Which type of enrichment is the most common form of enrichment offered to:

a) mammals in your area?

Novel food and food presentation \_\_\_\_\_

Novel items and experiences (e.g. toys, scents, audio, etc.) \_\_\_\_\_

Exhibit design and furniture \_\_\_\_\_

Interactions with conspecifics or other animals (including humans) \_\_\_\_\_

b) birds in your area?

Novel food and food presentation \_\_\_\_\_

Novel items and experiences (e.g. toys, scents, audio, etc.) \_\_\_\_\_

Exhibit design and furniture \_\_\_\_\_

Interactions with conspecifics or other animals (including humans) \_\_\_\_\_



4. Does your institution have an established method for keepers to obtain approval for conducting enrichment projects?  
Yes \_\_\_\_\_ No \_\_\_\_\_

5. To do enrichment in your area, are you given adequate:

- a) time? Yes \_\_\_\_\_ No \_\_\_\_\_  
b) support (e.g. resources, ideas, encouragement)? Yes \_\_\_\_\_ No \_\_\_\_\_

6. How should enrichment projects be evaluated to determine their effectiveness?

Scientific method \_\_\_\_\_ Informal observation \_\_\_\_\_ No evaluation needed \_\_\_\_\_

7. At this time, how many enrichment projects are being evaluated by scientific method at your institution? \_\_\_\_\_

8. How many enrichment projects in your institution have been:

- a) published in a scientific journal? \_\_\_\_\_  
b) published elsewhere (e.g. *AKF* or *Shape of Enrichment*)? \_\_\_\_\_  
c) presented at a conference? \_\_\_\_\_

9. Which of the following best describes a successful enrichment project?

- a) decreases stress \_\_\_\_\_  
b) decreases stereotypic or undesirable behaviors \_\_\_\_\_  
c) decreases aggression \_\_\_\_\_  
d) increases natural behaviors \_\_\_\_\_  
e) increases activity and thereby enhances visitor experience \_\_\_\_\_

10. Do you feel that you have the skills to:

- a) conduct a literature search on species of interest? \_\_\_\_\_
- b) write a proposal to initiate an enrichment project? \_\_\_\_\_
- c) compile an ethogram (list of behaviors to study)? \_\_\_\_\_
- d) design a study to evaluate an enrichment project? \_\_\_\_\_
- e) collect and analyze data to evaluate an enrichment project? \_\_\_\_\_

11. Is there an established network of keepers and/or professionals with experience conducting behavioral studies who are willing to advise you in conducting your own study? Yes \_\_\_\_\_ No \_\_\_\_\_

12. Do you believe that you would benefit from having a written example describing how to conduct an enrichment study - from proposal to final report? Yes \_\_\_\_\_ No \_\_\_\_\_

13. Which of the 1997 zoological conferences do you plan to attend?

National AAZK \_\_\_\_\_

Regional AAZK \_\_\_\_\_

National AZA \_\_\_\_\_

Regional AZA \_\_\_\_\_

Enrichment Conference \_\_\_\_\_

14. Which of the 1998 zoological conferences do you plan to attend?

National AAZK \_\_\_\_\_

Regional AAZK \_\_\_\_\_

National AZA \_\_\_\_\_

Regional AZA \_\_\_\_\_

**Return this survey to: Enrichment Questionnaire, *The Shape of Enrichment*, 1650 Minden Dr., San Diego, CA 92111.**



c) reptiles and amphibians in your area?

Novel food and food presentation \_\_\_\_\_

Novel items and experiences (e.g. toys, scents, audio, etc.) \_\_\_\_\_

Exhibit design and furniture \_\_\_\_\_

Interactions with conspecifics or other animals (including humans) \_\_\_\_\_

3. Excluding primates (because their enrichment is mandated by law) which 3 of the following groups of animals are most in need of enrichment in captivity? (Select 3 groups)

Marine Mammals		Other Mammals		Raptors & Vultures	
Large Carnivores				Pittacines	
Small Carnivores		Lizards & Tuatara		Water Birds	
Rodents & Rabbits		Snakes		Sea & Shore Birds	
Hoofed Stock		Turtles		Flightless Birds	
Pachyderms		Crocodilians		Other Birds	
Bats					

# WEBSITE UPDATE

Carol E. Kriegel, Children's Zoo Curator at Houston Zoological Gardens recently submitted the following Website information which she found in the spring 1996 issue of the Animal Welfare Information Center Newsletter (Vol. 7, No. 1; ISSN:1050-561Z), a publication from the USDA Agricultural Research Service.

**Zoonoses Website** - University of California Santa Barbara (UCSB) has an animal care website that features training information for researchers working with specific species, tips on searching for alternatives, guidelines for reporting concerns, UC policy statement on animal use, overviews of laws relating to animal care and use, and zoonotic diseases. The zoonotic disease page allows searching for disease information by animal reservoir or disease.

The URL is **<http://omni.uscb.edu/pro/acc-home.html>**.

A new website that addresses reptile-associated Salmonellosis can be found at **<http://www.xmission.com/~gastown/herpmed/salm.htm>**.

Topics addressed are routes of transmission, prevention, case histories, and bibliographies.

Other Websites which the AKF staff has become aware of include:

The **Sea Turtle Survival Trust** has a website which includes a map that will be regularly updated with the most recent migratory movements of four green turtles which are being



monitored by satellite transmitters on their backs. Scientists will offer weekly reports on-line, and observers will have an opportunity to submit questions and offer comments. The web site address is: **<http://www.cccturtle.org>**.

The **Wisconsin Regional Primate Research Center (WRPRC)** at the University of Wisconsin-Madison maintains the **PRIMATE INFO NET (PIN)**. The focus is an information resource for primatologists and includes a taxonomy, endangered primate listings, and the Primate-Talk Directory, newsletters, veterinary resources, etc. Documents can be viewed and downloaded locally.

To connect to **PIN**:

Via WWW, use:

**<http://www.primate.wisc.edu/pin/>**

Via Telnet, connect to

**[wiscinfo.wisc.edu](http://wiscinfo.wisc.edu)** and look for link to Primate Info Net via:

Library Catalogs and Services

Campus Libraries Information

UW Madison Libraries/Centers: P-T

Primate Center Library

Via gopher, connect to:

**[night.primate.wisc.edu](http://night.primate.wisc.edu)**

**The AAZK Website address is:**

**<http://aazk.ind.net>**



# Keeper To Keeper

## Using Developmental Milestones Data

By James Scott & Judie Steenberg  
Woodland Park Zoological Gardens, Seattle, WA

Collecting and comparing developmental milestones data to previously documented information on neonate development gives a keeper guidelines with which to gauge whether or not a neonate is developing properly.

Following is a comparison of data on a female Matschie's tree kangaroo (*Dendrolagus matschiei*) joey, studbook #311, named "Deenyi" (Figure 1). The data on this joey were collected from March through December 1995, by the authors, at the Woodland Park Zoological Gardens. Data collection occurred on a daily basis, using Dabek's 0/1 check-sheet (Figure 2). The check-sheets were kept on a clipboard which hung just outside the entrance door to the exhibit. It is important to mention that check-sheets and a pen were readily available and observations were recorded as they were made. Data should be recorded immediately after observation for best results; don't rely on your memory. The purpose of this exercise was to:

- 1) monitor the development of our tree kangaroo joey
- 2) to test the ease of using the form provided by the Tree Kangaroo SSP©

There had been some discussion among zoo personnel that the form was difficult to use... we found it easy to use, and effective.

Data were recorded at least twice daily. A zero (0) was logged if a behavior was not observed during the day and one (1) was marked when a behavior occurred. Observations were generally recorded between 0800 and 1600 hours. However, if a behavior occurred at anytime during the day, even if the observation was reported by another reliable observer such as a trained intern, another keeper or the zoo vet, an entry was recorded. This exercise was not intended to be a "scientific" study, but a keeper's daily recording of events to monitor the development of this joey.

Figure 1 gives a recap of our observations on "Deenyi" with her age recorded in weeks. When compared with previously published data (Dabek, 1990, Heath et al 1990, Franke 1995), it is apparent that "Deenyi" developed as predicted. Variations in the age at which milestones were reached could be explained by the variation in the time of day and number of hours of observation recorded in the four different studies. It is important to note that some of the significant observations on "Deenyi" were made "outside" of the keeper's routine. In fact, over the years Steenberg has noted that observations of wallaroo events such as "head first out of pouch" and "first pouch exit" generally occurred after regular zoo hours.

Number of Joeys/Sex Reference	<u>Age in weeks - when event was first observed</u>			
	(0.1) "Deenyi"	(2.0) Dabek	(1.0) Franke	(0.0.6) Heath

Developmental Milestones:

One limb out of pouch	21	-	20	-
Multiple parts out of pouch	21	-	22	-
Head out of pouch	23	22	24-25	-
First pouch exit	28	28	32	28
Fed alone (*eating solids)	28	27.5	28	27
Permanent pouch exit	39	41	40	-

Other Physical Characteristics:

Claws pigmented	-	-	7	7
Lower incisors	-	-	-	20
Upper incisors	-	-	30	-
Ears free from head	-	-	15	11
Ears becoming upright	24	-	-	-
Ears fully upright	26	-	-	-
Eyes open	-	-	21	20
Fine fur -dorsum of forelimbs	-	-	-	11
Fine fur -rhinarium	-	-	15	16
Fine fur -cloacal vibrissae	-	-	16	16
Fine fur -face	24	-	-	-
Darker fur on arms/legs	31	-	26	-
Dark pigmentation on tail	26	-	26	-
**Fully furred	27	-	29	22

Play Behavior - Joey with Dam:

While in pouch	26	-	29	-
Out of pouch	32	-	-	-

\* first incidence of chewing, having food in mouth, eating solids.

\*\* descriptions of this condition varied.

(Figure 1.)



Month/Year:\_\_\_\_\_ I.D./Name (Mother):\_\_\_\_\_ I.D./Name (Young):\_\_\_\_\_

0 = Behavior did not occur      1 = Behavior did occur      Note: Use 24-hour clock

													Date
													Observer Initials
													Time
													Head Out of Pouch
													Limb Out of Pouch:
													Unknown Limb
													Forelimb (Note 1 or 2)
													Hindlimb (Note 1 or 2)
													Tail Out of Pouch
													Completely Out of Pouch
													Head in Pouch:
													Head Bobbing (suckling)
													Comments (Can use other side and date entry)

(Figure 2.)

It is hoped that this short report will encourage other keepers to monitor and record data on the development of tree kangaroo joeys in their care. This research is useful both for the management of your tree kangaroos and to help the TK-SSP collect a larger data set on the developmental milestones of tree kangaroo joeys.

The check-sheet form we used is available from Lisa Dabek, Ph.D., the Tree Kangaroo SSP© Research Coordinator, Woodland Park Zoological Gardens, 5500 Phinney Ave. N. Seattle, WA 98103. It will also be included in the revised Tree Kangaroo Husbandry Manual due to be distributed later this year (1995).

## References

- Dabek, L. 1990. The social biology of tree kangaroos (*Dendrolagus spp.*) and its implications for captive management. AAZPA Regional Conference Proceedings. 528-35. Wheeling WV. Edited version in The Biology and Management of Tree Kangaroos. eds. M. Roberts and M. Hutchins. AAZPA Marsupial and Monotreme Advisory Group, Bulletin 1, 17-23.
- Franke, M.C. 1995. Early development chronology of a Matschie's tree kangaroo (*Dendrolagus matschiei*) through daily standing pouch checks. Animal Keeper's Forum, Vol.22, No.6. pp. 226-232.
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# News on Recent Publications from the Fort Worth Zoo — Rhino Husbandry Resource Manual & Canid, Hyena & Aardwolf TAG Newsletter

After more than four years of research, planning and production, the Fort Worth Zoo has recently published the AZA Rhinoceros Husbandry Resource Manual (M. Fouraker and T. Wagener, eds.). Funding and support for this publication was provided by International Rhino Foundation, the AZA Rhino Taxon Advisory Group (TAG), White Oak Conservation Center and the Fort Worth Zoo. All U. S. and international institutions holding rhinos, as well as contributors and meeting participants, were forwarded complimentary copies.

This manual was designed as a guide to captive management of the three most common species of rhinos currently held in institutions worldwide: the white rhino, the black rhino, and the greater one-horned rhino. It includes chapters on Taxonomy and Conservation Status, Management and Behavior, Design, Health, Nutrition and Research, as well as appendices on general rhinoceros behavior (a manager's ethogram), information specific to Sumatran rhinos, and data needed.

If you would like to purchase a copy of this manual, please send a check or money order for \$12 (\$15 int'l) payable to the Fort Worth Zoo to: Tarren Wagener, Rhino Husbandry Resource Manual Co-Editor, Fort Worth Zoo, 1989 Colonial Parkway, Fort Worth, TX 76110.

The first issue of *CHAT*, the newsletter for the Canid, Hyena & Aardwolf TAG (J. Grisham, TAG Chair; T. Wagener and H. Emery, newsletter co-editors) has also been produced by the Fort Worth Zoo. The purpose of this publication is to network and share information with all individuals interested in canid, hyena and aardwolf conservation, both *in situ* and *ex situ*. Funding and support for the newsletter were provided by the Fort Worth Zoo.

This issue includes feature articles on Mexican wolves and on the taxonomic and legal status of the Canidae and Hyaenidae families. Regular newsletter elements will include husbandry notes; meeting summaries/information on upcoming meetings; updates on recently completed or ongoing research; citations for recent publications; news briefs on AZA captive programs and reintroduction efforts; and AZA canid, hyena and aardwolf contacts. The editors welcome submissions for future issues of this newsletter, which will be published twice a year.

If you could like to be added to the *CHAT* mailing list, please send a check or money order for \$6.00 payable to the Fort Worth Zoo to: Tarren Wagener, *CHAT* Co-Editor, Fort Worth Zoo, 1989 Colonial Parkway, Fort Worth, TX 76110.

If you have any comments or questions on either publication, or if you would like to submit articles for future issues of *CHAT*, please contact Tarren Wagener at the address above or - Phone - (817) 871-7487; Fax - (817) 871-7012; e-mail: zoocons@aol.com.

# AAZK Announces New Professional & Contributing Members

Jennifer Dustin, **Live Animal (MA)**; Craig Kasner, **Stone Zoo (MA)**; Jane E. Yaniro **no zoo listed (NY)**; Aimee M. D'Angelo, **Buffalo Zoo (NY)**; Carie L. Bartley, **Pittsburgh Zoo (PA)**; Leslie Polatajko, **Trexler Lehig Co. Game Preserve (PA)**; Susan Congdon, **Riverbanks Zoo (SC)**; Michelle Leonard, William Bob Harris, Dawn Hernden, Terry T. Black, Holly Morrell, and John Abbott, **Lion Country Safari (FL)**; Julie Oakley, Amy Catherine, Steffany L. Sowards and Angie Walter, **Knoxville Zoo (TN)**; Thomas J. Watson III, **Detroit Zoo (MI)**; Scott Withington, **Belle Isle Zoo & Aquarium (MI)**; Sheila Grooms, **Wilderness Kingdom Zoo (IA)**; Caren Thillens, **St. Louis Zoo (MO)**; Steve Kaup, Elizabeth Fenno, and Manuel Martel, **Rolling Hills Refuge (KS)**; Suzanne Foret, **Brec's Greater Baton Rouge Zoo (LA)**; Mary Carter, **Houston Zoo (TX)**; Joe Probert, Mike Spencer, Evelyn Childs and Linda Condrey-Ellison, **Tautphaus Park Zoo (ID)**; Erick Lamun, **Animal Ark Wildlife Center (NV)**; Cathy Schoonmaker, **Los Angeles Zoo (CA)**; Heidi Lake Sellers, **The Living Desert (CA)**; Patty Shreve, **Oregon Coast Aquarium (OR)**; Candy Serfling, **Wildlife Safari (OR)**; Carol Nork, **The High Desert Museum (OR)**.

## New Contributing Members

Cleveland Metroparks Zoo Library,  
Cleveland, OH

## Renewing Contributing Members

Mark Hofling, Bronx Zoo (NYZS),  
Bronx, NY  
Seneca Park Zoo Library, Rochester, NY  
Robert R. Bean, International Zoo  
Research & Exchange, Knoxville, TN  
John Tobias, Director, Miller Park Zoo,  
Bloomington, IL  
Dickerson Park Zoo, Springfield, MO  
Moody Gardens, Inc., Curatorial Dept.,  
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1-800-468-1966 (Canada)

Office Hours:

9:00 a.m. - 3:00 p.m. CT

FAX: (913) 273-1980

or write

AAZK, Inc.

635 S.W. Gage Blvd.

Topeka, KS 66606-2066  
U.S.A.





# AAZK Publications Available

**AAZK Diet Notebook, Mammals, Vol. 1** - reference work containing 325 diets representing 213 species and subspecies from 14 participating institutions. Diets are arranged taxonomically using ISIS numbers. Comes in sturdy 3-ring D binder. Each Diet Response Form includes common name, scientific name, ISIS number, contributing individual and their institution, how long the diet has been used, whether the animals have bred on this diet, the diet ingredients, preparation instructions, notes and remarks on special considerations, and nutritional analysis (when available). The publication is in its second printing and is copyrighted by AAZK, Inc. Cost is \$40.00 for AAZK members; \$55.00 for Nonmembers; \$70.00 for Institutions. Prices are for prepaid orders and include U.S. and Canadian shipping. Overseas orders should add \$20.00 for parcel post surface shipping.

**Zoonotic Diseases, 2nd Edition** - 40-page reference work details the most common zoonotic diseases, offers guidelines for preventive control and covers personal hygiene and disinfection procedures. Information for each disease is presented in a text format and includes etiologic agent, means of transmission to man, global distribution, alternate or intermediate hosts, human incubation and human symptoms. Cost is \$8.00 for AAZK members; \$12.00 for Nonmembers. Price includes domestic shipping; orders outside U.S. and Canada should add \$3.00 per copy for air mail.

**HALF PRICE - Zoo and Aquarium Professionals: The History of AAZK** - 216-page volume chronicles the history of the American Association of Zoo Keepers, Inc. from its beginnings at the San Diego Zoo in 1967. Includes early evolution of the Association, its projects, programs and committees, the histories of its 70-plus Chapters and its involvement in the highly successful conservation program "Bowling for Rhinos". Cost is \$5.00 for AAZK Members; \$8.00 Nonmembers. Orders outside U.S. should add \$3.00 per copy for postage.

**"What Kind of Animal Are You?"** - 40-page collection of zoo keepers' favorite anecdotes about their work, the animals, and the visitors. Produced by the Brookfield Zoo Chapter and edited by John Stoddard. LIMITED NUMBER AVAILABLE. Cost is \$5.00 for AAZK members; \$8.00 for Nonmembers. Non-domestic orders add \$3 for shipping.

To order any of the above, send your name, complete mailing address, phone number, number of each item you wish to order and a check or money order (U.S. Funds only) made payable to AAZK, Inc. Send to: AAZK Publications, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Mastercard or Visa orders accepted by telephone only - call 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada).

# ***AAZK Launches Junior Zookeeper Program***

*submitted by Diane Callaway*  
*AAZK Vice President*



During the National AAZK Conference in Detroit it was announced that we have embarked on a new membership category. This category is the Junior Zoo Keepers' Category for children ages 8 to 12 years. We hope to provide an avenue for young future zoo keepers to follow, strengthening the professionalism of this field as well as boosting our membership. The Junior Zoo Keeper membership cost is \$12.00 per year. Each membership includes 4 issues of the *Junior Keepers' Forum* and an embroidered patch of their logo.

In order for the Junior Keeper membership to become a reality we will need participation from our AAZK Chapters! The *JKF* will be edited by Diane Callaway at Omaha's Henry Doorly Zoo, but we are seeking help from chapters on a financial level as well as a personal one.

This publication will need volunteers to help answer letters and submit articles. Because this is a national project we would like to see keepers from a wide variety of zoos providing input. We will also need to get the word out about this exciting new project. We are counting on docents and zoo keepers to pass out membership flyers to children after group tours, demonstrations, and lectures.

Because we are trying to improve the financial status of AAZK, Inc. all funding for this publication must be sought elsewhere. We are hoping that the chapters will fund the initial costs for printing until this can support itself. Since the *JKF* is a quarterly publication it shouldn't be difficult to find Chapters that will graciously contribute to this worthwhile endeavor.

The Rocky Mountain Chapter of AAZK has started us all off by funding the costs for this years membership patch, and the Omaha Chapter AAZK funded the printing costs for the membership cards. A big heartfelt thanks goes to both Chapters!

Please help make this project a reality! If anyone needs membership cards or is interested in helping with this publication or sponsoring an issue please contact: Diane Callaway, Omaha's Henry Doorly Zoo, 3701 S. 10th St., Omaha, NE 68107. PHONE:(402) 733-8401, FAX:(402) 733-7868, E-Mail:DJMHDZ@AOL.COM



# The "Drop-Chute" Hoofstock Restraint As An Alternative to Chemical Immobilization At The San Diego Wild Animal Park

By

*Adam Petrovsky, Mammal Keeper*

*Andy Blue, Lead Mammal Keeper*

*Isolation/Shipping Pens - Outer Areas*

*San Diego Wild Animal Park, Escondido, CA*

## Overview

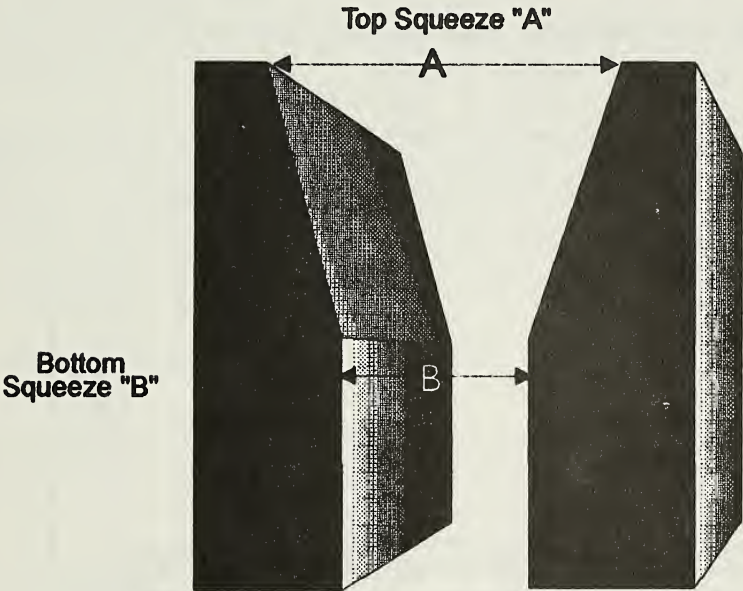
The San Diego Wild Animal Park maintains a large variety of ungulates (close to 100 species; just under 1500 specimens), including the largest collection of deer species in captivity. Incorporated into large multi-species exhibits, this enormous number of animals allows for observation of natural behaviors and requires extensive herd-management. With a large collection of hoofstock comes the reality that the Wild Animal Park ships out hundreds of animals per year (361 shipments in 1995). Nearly every animal leaving the park must be given a "pre-ship" medical examination, which may include blood sampling, tuberculosis skin testing, stool collection, transponder implantation (microchip identification) and a general health exam.

Until 1994, most of these examinations required full chemical immobilization. Serious drug-related side-effects associated with chemical immobilization include animal respiratory difficulties, heart arrhythmias, over-narcotizing/sedation, unborn fetal pathologies and animal death. Chemical immobilizations also require additional veterinary and keeper staff, are time and labor intensive, and necessitate additional post-immobilization support for the animal undergoing the procedure. An alternative method of immobilizing hoofstock without these potentially harmful side-effects is the "drop-chute" technique. This procedure has been utilized widely within the cattle industry and is used successfully on deer and with certain species of exotic hoofstock at the San Diego Zoo. The technique has been adopted at the Wild Animal Park. To date, over 300 animals representing 31 species have been "drop-chuted." The "drop-chute" procedure has proven to be a safe, low-cost, lower-stress alternative to chemical immobilization for pre-shipment examination.

## Description of the "Drop-Chute" Device

The primary device used at the Wild Animal Park is "The Tamer", manufactured by Fauna Products International (Figure 1). The Wild Animal Park's shipping/holding facilities have been mechanically modified to accommodate the machine (Figure 2). Simply described, the "drop-chute" is an elevated squeeze tunnel

with a drop-out floor. Once the animal is in the tunnel, the floor is dropped out from underneath it. Its weight is supported entirely by the squeeze walls, thus allowing it no contact with the ground. Access panels on the sides of the chute allow restraint of the head and body. Veterinarians perform examinations through a front door while the animal is restrained.



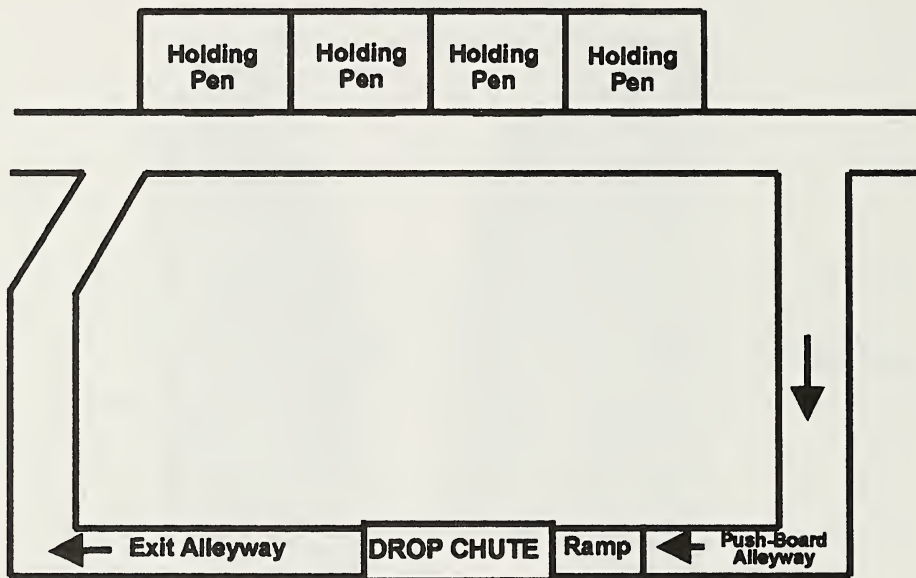
**Fig. 1: Cross Section of "The Tamer" Drop- Chute showing top and bottom example adjustable dimensions.**

<b>Drop Chute Setting</b>	<b>"A" Measurement</b>	<b>"B" Measurement</b>
1,1	20.5"	5"
1,2	22"	6.5"
1,3	23"	8"
1,4	25"	10"
2,2	23"	7.5"
2,3	24"	9"
2,4	26"	11"
3,3	26"	11"
3,4	28"	12"
4,4	30"	14"

The Wild Animal Park's shipping/holding facilities are specifically designed so the "drop-chute" device is accessible from any pen through a series of alleyways. Prior to the procedure, keeper and vet staff meet to properly set up the "drop-chute", assign staff responsibilities and review the process. The chute has four



settings (two on the front, two to the rear) which control the width of the device. The settings on the "drop-chute" allow it to be used for animals as small as (20.4 kg (45 lbs. ) or as large as 204 kg ( 450 lbs.). Records are maintained on each and every procedure, including: species, date of procedure, settings on the chute and a comment section to indicate whether the settings were appropriate. From this data, keepers can make accurate decisions regarding settings for future "drop-chute" procedures.



**Figure 2. Map of Shipping/Holding area at San Diego Wild Animal Park, including "Drop Chute"**

### **"Drop-Chute" Technique**

Typically, the "drop-chute" procedure requires at least six keepers. Two keepers bring the animal down the alleyway, up the ramp and into the chute. These people are also responsible for returning the animal to its pen after the procedure. A third keeper closes doors behind the animal along the alleyway and is responsible for the release lever which drops the floor. Four additional staff members are positioned at the access panels on either side of "The Tamer" and restrain the head and body once the floor is dropped. One of these keepers is also required to open the front door of the "drop-chute" and to release the squeeze panels after the procedure is done. A veterinarian is present to perform the examination. Additional staff is always helpful and sometimes needed for larger or more typically difficult animal species.

When the chute is set appropriately and staff members are in position, the animal is moved from his pen into the alleyway leading to the "drop-chute". A series of safety doors in conjunction with wooden and aluminum push-boards

facilitate in moving the animal toward the chute. Reaction of the animals toward the device is individual. Especially flighty animals require patience and caution while some hand-reared sub-adults walk easily toward the device. Once in the final alleyway leading to the drop-chute ramp, a safety door is latched behind the animal and this door glides on an overhead track down the alleyway pushing the animal safely onto the ramp without fear of keeper injury from a nervous animal. As soon as the animal is in the chute, the floor is immediately dropped. This essentially immobilizes the animal since its entire weight is resting on the narrowing sides of the chute. Once the animal is fully restrained, the front of the chute is opened and the veterinarian performs the necessary medical procedures.

After the examination is complete, the sides of the chute are slowly released and the animal is dropped safely to the ground. It is then returned to its pen through a looping alleyway and carefully observed for any obvious trauma. If problems are encountered while the animal is in the chute (i.e. incorrect settings), it can always be released and run through the chute a second time once corrections to the settings are made.

### **Difficulties Encountered During the Procedure**

Most "drop chute" procedures run very smoothly. Settings are determined by referencing previous settings for similar species. Most difficulties involve an incorrect chute setting or a problematic animal.

Although every attempt is made to accurately assess the correct chute settings, occasionally an animal does not fit the size profile for its species or a new species may need to be dropped. In this case, a "best guess" is made by comparing similar species that have undergone the process. If the chute has been set incorrectly, the attempt may be aborted.

On occasion, the animal's behavior presents difficulties to the procedure. These include: hesitancy in moving down the alleyway, "doubling-back" while in the alleyway, refusing to go up the ramp, excessive struggling in the chute, catching a leg up and out of the squeeze walls, or spinning over backwards/reversing directions (especially in cervids). Each of these problems are resolved by carefully assessing each situation individually. If necessary, the procedure is stopped and re-attempted using a different approach to a problematic animal. For this reason, it is important to have trained staff involved in any "drop-chute" procedure. It is also critical for keepers to gain control of the head as soon as possible once the animal is "dropped". This minimizes the chances of animal injuries.

### **"Drop Chute" Comparison**

To date, there have been no formal studies comparing the efficacy of the "drop-chute" method vs. chemical immobilization for pre-ship examinations in non-domestic hoofstock. It is, however, possible to review veterinary medical records





Above, Keeper Valerie Engel, Animal Care Manager Rich Messina and Veterinarian Jack Allen standby outside the drop-chute until the animal has been "dropped". At left, Keeper Joe Kalla prepared to pull the floor-release lever once the animal is in the drop-chute.



At right, Keeper Laura Debnar uses an aluminum shield to guide this lowland nyala down the drop-chute alleyway.



**Photo Credit:**

*All photos for the Drop Chute article are by Craig Racicot, polar bear Keeper at the San Diego Zoo.*





**Animal Care Manager Rich Messina with Keepers Joe Kalla and JoAnn Haddad restrain a lowland nyala after it has been "dropped". At right, Veterinarian Jack Allen performs routine tuberculosis testing once the animal is restrained.**



**Keeper Joe Kalla and Animal Care Manager Rich Messina release the animal after the procedure is complete.**



**Table 1. Species of Hoofstock "drop-chuted" at  
the San Diego Wild Animal Park**

<u>Scientific Name</u>	<u>Common Name</u>
<i>Aepyceros melampus rendilis</i>	Kenya Impala
<i>Antilope cervicapra</i>	Blackbuck Antelope
<i>Bison bonasus</i>	European Wisent
<i>Box javanicus</i>	Javan Banteng
<i>Bos taurus</i>	Ankole Cattle
<i>Boselaphus tragocamelus</i>	Indian Nilgai Antelope
<i>Cervus axis axis</i>	Indian Axis Deer
<i>Cervus duvaceli duvaceli</i>	Barasingha (Indian Swamp Deer)
<i>Cervus elaphus sibiricus</i>	Altai Wapiti
<i>Cervus eldi thamin</i>	Burmese Eld's Deer
<i>Cervus nippon hortulorum</i>	Dybowski's Sika Deer
<i>Cervus nippon mandarinus</i>	Tonkin Sika Deer
<i>Cervus nippon taiouanus</i>	Formosan Sika Deer
<i>Cervus porcinus porcinus</i>	Indian Hog Deer
<i>Cervus unicolor malaccensis</i>	Malayan Sambar
<i>Gazella dama ruficolis</i>	Addra Gazelle
<i>Gazella granti roosevelti</i>	Roosevelt's Gazelle
<i>Hemitragus jemlahicus</i>	Himalayan Tahr
<i>Hippotragus niger</i>	Sable Antelope
<i>Kobus ellipsipymnus</i>	Ellipsan Waterbuck
<i>Kobus Kob thomasi</i>	Uganda Kob
<i>Kobus megaceros</i>	Nile Lechwe
<i>Oryx gazella callotis</i>	Fringe-eared Oryx
<i>Oryx gazella damman</i>	Scimitar-Horned Oryx
<i>Oryx gazella gazella</i>	Gemsbok
<i>Oryx leucoryx</i>	Arabian Oryx
<i>Taurotragus oryx pattersonianus</i>	Patterson's Eland
<i>Tragelaphus euryceros isaaci</i>	East African Bongo
<i>Tragelaphus spekei spekei</i>	East African Sitatunga
<i>Tragelaphus strepsiceras</i>	Greater Kudu

of chemical immobilizations for pre-ship examinations on hoofstock prior to the initiation of the "drop-chute" device. This data can be compared to the records of 318 animals that have undergone "drop-chute" procedures. The comparison looked at the following areas: animal injury and/or death (including post-procedural), labor (veterinary and keeper staff), and overall efficiency (measured by how many procedures could be performed over a specific time span with specific staff requirements).

The following criteria were used to compare "drop-chute" pre-shipment examination versus pre-shipment chemical immobilization examination:

1. Animals compared must have been classified as a mammal that had the ability to undergo the drop-chute technique (e.g. primates, caprids, animals too large or too small to fit into the drop chute, or inappropriate species).
2. Animals compared must have been listed as "Pre-Ship" on the veterinary daily medical log as the reason for examination (this disqualified animals examined for reasons such as: medical, euthanasia, relocation, quarantine, annual health exam, research or vaccination).
3. Animals must have been located at the Shipping/Holding facilities at the Wild Animal Park.
4. Animals that could be manually restrained ("hand-grabbed") for pre-ship examination were excluded.
5. Only injuries or deaths occurring immediately prior to, or post-procedural, were considered to be relevant.

The first "drop-chute" technique was performed on 12 January 1993 on a juvenile male nyala (*Tragelaphus angasi*). Since that date, the Wild Animal Park has "dropped" 318 animals for the purpose of pre-shipment examination. During this period only three injuries directly related to the procedure were found. In each of these cases the injury involved a limb (two fractures and one lacerated tendon) and secondarily resulted in euthanasia. These injuries were either caused by a problematic animal which struggled in the device or during the drop to the ground. This ratio (318:3) produces a 99.06% success rate. Reviewing the last 318 animals chemically immobilized for pre-ship exams prior to establishing the "drop-chute", 27 separate incidents of injuries/deaths were reported (four deaths directly related to anesthesia). This ratio (318:27) yields a 91.5% success rate. Many of these injuries occurred in the 4-12 hour period following reversal of the narcotic and most involved animal self-injury in the post-procedure period. Such injuries included: lacerations, fractured vertebrae, various limb fractures and lip or hoof injury.

An important secondary complication to chemical immobilization that did not occur with the "drop-chute" method was the large number of "re-narcotizations" documented on veterinary records (not included in the 27 animals listed). A



“re-narcotization” is defined as an animal that has previously recovered from the narcotic given at the time of examination AND that subsequently shows symptoms of narcotization 4 to 72 hours following the procedure. Reversal of symptoms requires the administration of an antagonist (usually intramuscularly injected through a dart gun). Of the 318 cases examined, 17 animals required re-darting with a reversal agent (some animals required multiple dosing). Animals who become “re-narcotized” share risk factors for other medical complications including: death, post-traumatic injury, injury to enclosure-mates, and keeper injury.

While the “drop-chute” technique requires at least six keepers and a veterinarian, multiple animals can be dropped consecutively in a short time span. For example, 11 barasingha (*Cervus duvacei duvacei*) were drop-chuted in 53 minutes for pre-ship examination. Equivalent procedures performed using chemical immobilization require similar staffing, but average approximately 30-50 minutes per animal.

## Summary

The drop-chute technique for non-chemical immobilization of hoofstock at the San Diego Wild Animal Park has proven to be a valuable alternative to sedation/narcotization for pre-shipment examinations. Hundreds of animals have undergone the “drop-chute” procedure with little or no incident, thus avoiding the stress and undesirable side effects of chemical immobilization. “Drop-chute” procedures appear to cost less, bear less risk of animal injury/death and allows pre-shipment examination to be performed with less stress to the animal. This technique is an integral part of the shipping procedures at the Wild Animal Park.

*(Editor's Note: The authors have made us aware that The San Diego Wild Animal Park has a very nice video demonstrating some of the items discussed in this paper. This tape could be made available to other facilities upon request.)*

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## 1997 Elephant Research Symposium

The Pittsburgh Zoo is pleased to announce that we will be hosting The Second Annual Elephant Research Symposium in mid-1997. We encourage participation from all facets of elephant care. We hope to have keepers, curators, directors, veterinarians, researchers, circus members, docents, and students attending. This broad mix is necessary to learn the valuable information making captive breeding a reality for elephants. Projected topics are Exhibit Design, Veterinary Care, Reproductive Research and Assessment, and *in-situ* and *ex-situ* research. For further information contact: Lee Nesler or Joan Warren-Jackson at Phone: (412) 665-3651; Fax (412) 665-3925.

# 1997 Gorilla Workshop Planned

The Pittsburgh Zoo is pleased to announce that we will be hosting The International Gorilla Workshop April 2-5, 1997. Projected topics will include advances in husbandry techniques, exhibit design, veterinary care, cutting-edge enrichment methods, and *in-situ* and *ex-situ* research.

The workshop will be held at the Sheraton Station Square. The hotel is adjacent to the Freight House Shoppes, a restored turn-of-the-century railroad station. It houses many restaurants, clubs and shops. The keynote speakers will be the directors of the Mbeli Bai Lowland Gorilla Project.

The tentative schedule is as follows:

Wed., 2 April - Icebreaker  
Thurs., 3 April - Paper Sessions  
Fri., 4 April - Paper Sessions  
Sat., 5 April - Paper Sessions/Zoo Day  
Sun., 6 April - Post-conference trip

Registration packets are now available. (Please note that if you received an early registration packet, there was a typo in the conference dates on the cover letter. All other date information in this early packet was correct.)

For further information contact Debra McGuire or Roseann Giambro at (412) 665-3794; FAX (412) 665-3661

## Coming Events

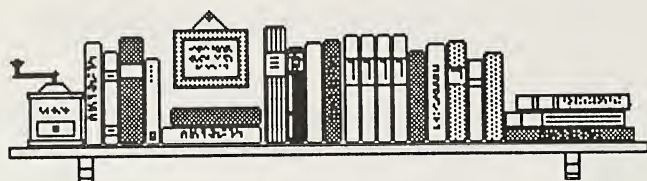
**17th Annual Elephant Managers Workshop** - January 24-27, 1997 in Jacksonville, FL. Hosted by Jacksonville Zoological Gardens. For further information, contact: Steven M. Wing, Curator of Mammals, Jacksonville Zoological Gardens, 8605 Zoo Parkway, Jacksonville, FL 32218 (904) 757-4463 or (904) 757-4315 [fax].

**AZA Schools for Zoo and Aquarium Personnel** - February 3-8, 1997 - (Professional Management Development for Zoo and Aquarium Personnel; Applied Zoo and Aquarium Biology; Principles of Elephant Management, Studbook I, Population Management; Science of Zoo & Aquarium Animal Management; and Conservation Education Training Program) will be held at Oglebay Park. For further information, contact AZA Office of Membership Services, Oglebay Park, Wheeling, WV 26003.

**The 5th Annual Conference of the International Association of Avian Trainers and Educators** - February 7-10, 1997 in Concord, CA. Hosted by Marine World Africa-USA. For information contact: Polly Gusa, Land Animal Coordinator, Marine World Africa-USA, Marine World Parkway, Vallejo, CA 94589, (707) 644-4000 Ext. 212 or FAX (707) 644-0241.

**1997 Enrichment Conference** - October 13-17, 1997 in Orlando, FL. Hosted by Sea World of Florida. For more information, contact: Thad Lacinak, 7007 Sea World Drive, Orlando, FL 32821-8097 USA. Call (407) 363-2651.





# Book Review

## Pheasants of the World: Their Breeding and Management

By Keith Howman, 1993

Hancock House Publishers, 1431 Harrison Avenue

Blaine, WA 98231

Hardback, 184 pgs.

\$70

*Review by Jacqueline Peeler*

*Keeper- Sonoran Desert Exhibit*

*North Carolina Zoo, Asheboro, NC*

With the loss of natural habitats a variety of animal species are under increased pressure to survive in the wild. One-third of the pheasant species are now in danger in their native habitats. With the threat to many pheasant species in the wild, there is a need to examine the management techniques of captive pheasant populations. Keith Howman offers his years of experience as a pheasant breeder as a basic guide in his book Pheasants of the World: Their Breeding and Management.

The introduction and first chapter cover several conservation topics, including reasons for species' decline, projects the World Pheasant Association are working on, and reasons for habitat destruction. Keith Howman's thoughts on the importance of captive breeding and conservation are illustrated by his account of the Cheer Pheasant Reintroduction Project. The World Pheasant Association, with the help of private breeders, were able to reintroduce the Cheer Pheasant back into its native habitat.

The reader is introduced to the basics of pheasant husbandry and management in chapters two through six. Starting with guidelines for building a pheasant aviary, this section of the book progresses to the selection of stock, stock management, feeding procedures, and breeding information. Filled with great photographs and numerous references for more detailed information, this section will interest the experienced breeder and help get the novice started.

Chapter seven reviews 49 pheasant species. Highlighted with numerous photographs, each species is briefly described. Information on natural history as well as additional information on the minimum aviary size, status in captivity, incubation, and feeding habits are included. The final sections of the book examine ways to individually mark birds (leg and wing bands), CITES regulations, and information on the World Pheasant Association.

Keith Howman is past chairman and present Director General for the World

Pheasant Association. The second edition of his book is a clear and concise guide to the husbandry and management of captive pheasants. Not intended as a scientific text, the book instead is based on the author's experience at raising pheasants over the last 27 years. With a price of \$70 (US) this book is a valuable reference tool for both the beginner and the experienced aviculturist.

On Behavior: Essays and Research

By Karen Pryor, 1995

Sunshine Books, 4481 SE 166th St.

North Bend, WA 98045

Paperback, 405 pgs. Price:\$24.95

*Review by Kelly K. Miles, Zoo Volunteer  
Woodland Park Zoo Seattle, WA*

On Behavior is a collection of essays and articles by Karen Pryor, author of Don't Shoot the Dog and Lads Before the Wind: Diary of a Dolphin Trainer, among others. Organized in 23 chapters, each has an introductory note by the author about why the article was written and a postscript that describes what happened as a result of the publication.

Half of the chapters are on whales and dolphins, but the principles can be applied to any animal. The book is diverse in its application. For instance, Chapter six covers the author's work with keepers at the National Zoo, and Chapter 17 addresses human parents and innate behavior. All of the chapters have been published in a variety of books, journals, and magazines, but it is very convenient to have the collection all in one book, with its useful bibliography and index.

This book offers valuable insight into animal learning, shaping and communicating. The author continually stresses the 'power of praise and the perils of punishment'. By focusing on behavior, learning, reinforcement and training without punishment this book is applicable not only to sea mammals, zoo animals or pets; but also to family, friends, and co-workers.

On Behavior demonstrates the power and possibilities of operant procedures and shaping. This book could easily be used as a text book or just enrichment for a reader.

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**WOLF VOTE:** Wolves in Alaska are "doing the macarena" following approval by the state's voters of a ballot initiative to ban the use of airplanes to hunt the species, says Joel Bennett, Defenders of Wildlife AK representative. The vote was 57% in favor, 43% opposed based on incomplete returns. A coalition of conservation groups in the state pushed the ballot measure.

*GREENLINES Issue #249*



# Marketing Your Manure: You Can Do It!

by Eric R. Eaton, Cincinnati, OH



Tom Gannon outlined some strategies for selling "zoo doo" in his article on the subject of scat in the August 1996 issue of *Animal Keepers' Forum* (Vol. 23, No. 8). To go further in depth, any successful sales campaign for such a unique product would benefit from some liberal doses of humor, endorsements, and eye-catching packaging. One promising, but admittedly unproven, idea incorporates all of these elements and adds an almost subliminal educational message as well.

While human gardeners and farmers may be the principal consumers of animal waste in urban and suburban environments, insects form the chief disposal crew in nature. What better salesman, then, than the dung beetle, to promote zoo doo? What more ringing endorsement could there be than a "dung beetle approved" label on your bag, be it bulk - or novelty- size? After all, "if it's good enough for my offspring, then it's good enough for your garden". Events like the Spring and Fall Zoo Doo Fecal Festivals at Seattle's Woodland Park Zoo would do well to have a costumed dung beetle mascot as a friendly liaison between customers and regular zoo personnel.

Besides the wording on packages, a caricature of a dung beetle would be a shopper-friendly, eye-catching-catching logo. Combine that with a "nutritional information" label and you have a sure-fire, light-hearted gimmick. Including a life history summary for the dung beetle character also furthers your institution's commitment to education by addressing the all-too-neglected world of insects.

With proper research, you zoo's graphic department could design such packaging or, alternatively, the author would be happy to work with you on such a project. There are more than enough scarab beetles species for every zoo in the world to have its own individual "spokesscarab". There is at least one enterprise that manufactures highly-accurate, custom-made mascot costumes in foam rubber.

Regardless of whether you choose this particular approach to zoo doo sales, pursue your style with enthusiasm, creativity and professionalism. Good luck!

*(Eric is an Associate member of AAZK and may be reached at 28112 Price Ave., #3, Cincinnati, OH 45204-1485; phone (513) 921-1593.)*

*Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks/AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing date for positions available and when setting these dates keep in mind that because of bulk-mail, most readers do not receive the AKF until the middle of the month or later. There is no charge for this service and phone-in or fax listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is (913) 273-1980.*

**ELEPHANT KEEPER**...the position requires at least three (3) year's experience working with elephants in free contact. Responsibilities include the care and daily maintenance of two young female African elephants, as well as other hoofed animals. Must be able to run elephant rides and do demonstrations for the public. Send resumé to: Natural Bridge Zoo, P. O. Box 88, Natural Bridge, VA 24578 or fax (540) 291-1891.

**ZOO KEEPER**...seeking mature, self-motivated person to work in small zoo. Requires high school diploma and paid zoo experience. Must be experienced in all aspects of captive animal care, work well with the public and co-workers. Construction and reptile care experience valuable asset. Must be willing to work weekends and some holidays. Duties include but not limited to animal and reptile care, exhibit maintenance and construction, and lecturing to the public. Non-smoker preferred. Salary \$14,500.00 - \$15,500.00, commensurate with experience, plus health insurance. Send resumé and references to: Soco Gardens Zoo, 904 Soco Road, Maggie Valley, NC 28751, Attn: Jim Miller. Resumés accepted until position filled.

**ASSISTANT ELEPHANT TRAINER**...this position requires a Bachelor's degree in Zoology or Animal Science, plus at least two years experience working with both adult and young Asian elephants. Protected contact experience will not be considered relevant. Applicant must have good speaking skills and experience presenting elephant demonstrations. Contact: Don Bloomer, Entertainment Department, Nugget Hotel/Casino, P. O. Box 797, Sparks, NV 89432.

**TEACHING ZOO SUPERVISING HEAD KEEPER**...Central Florida, diverse collection of primates, big cats, large hoofstock, and herps. Student staff/15-20 per class. Salary commensurate with experience. Will consider part, full-time or swing shift. Send resumé to: MNP, P. O. Box 2319, Belleview, FL 34421.

**VOLUNTEER ZOOKEEPERS**...needed for breeding and releasing native Costa Rican avifauna. Main duties include captive animal husbandry in a zoo setting which displays birds, mammals and reptiles and working at the front gate/gift shop. Research will include monitoring released birds, bird censusing and butterfly and plant identification. Zoo Ave is a non-profit foundation officially recognized as a Wildlife Rescue Center for injured and confiscated wildlife. Individual project proposals in animal husbandry, public education and animal behavior will be considered. Shared housing provided. Board expenses may be paid depending on funding. Send a resumé, dates of availability and a letter of interest to: Suzanne Chacon, Fundacion de la Naturalea c/o Zoo Ave., Dept. 280, P.O. Box 025216, Miami, FL 33102 or Fax 011-506-433-9140 (Costa Rica).

**KEEPER**...excellent opportunity to work at rapidly expanding Species Survival Center. Requires valid drivers license, reliable transportation and one year's paid experience working with birds and mammals. Must be highly motivated, team player, with ability to work on his/her own. Starting salary is \$15,000.00 to \$18,000.00 depending on experience and ability. Position open until filled. Send resumé to: The Audubon Institute, P. O. Box 4327, New Orleans, LA 70178. Attn: Human Resources.



**ANIMAL KEEPER/MAMMALS**...Caribbean Gardens in Naples, FL has one position available in its animal care staff and is establishing a file for future openings. The successful candidate shall be a team player with a positive attitude and have at least one year's paid experience in the management of exotics or a bachelor's degree in biological sciences. Keepers will be involved in husbandry, record keeping, enrichment activities, assisting veterinarian, and participating in "Meet the Keeper" programs. Salary shall be commensurate with experience and/or education. Benefits include: vacation, sick days, health insurance, profit sharing plan, and bonuses. Send resumé **by 31 January 1997** to: Caribbean Gardens, 1590 Goodlette Road, Naples, FL 34102. (941) 262-5409 EXCT. 107; FAX (941) 262-6866; e-mail: cagar@naplesnet.com

**ZOOKEEPER I**...two (2) permanent part-time positions (50% and 80%) include benefits. Starting salary is equivalent to \$12.20 per hour. Requires a minimum of one full year paid experience in the care, handling, and feeding of animals in a zoo setting. Twelve units of accredited college level course work in animal science, zoology, biology, wildlife management, or closely-related field is required, but may be exchanged for an additional year of experience. Valid California driver's license will be required. Successful applicant will work all areas, work Saturday, Sunday, and all holidays, and get along very well with staff and public. Small, city-operated zoo featuring non-releasable North American wildlife. Applications will be accepted at the City of Folsom Personnel Dept., 50 Natoma St., Folsom, CA 95630 **until 3 January 1997**.



Happy Holidays Ya'll From Houston  
--Elvis and Hoser

# AAZK Membership Application

check here if renewal [ ]

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State/Province \_\_\_\_\_ Zip \_\_\_\_\_

## U.S. Members

☐

**\$35.00 Professional**  
*Full-time Keepers*

☐

**\$30.00 Affiliate**  
*Other staff & volunteers*

☐

**\$30.00 Associate**  
*Those not connected with  
an animal facility*

☐

**\$60.00 or up - Individuals**  
**Contributing/U.S.**

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**\$100.00 or up**  
**Institutional/U.S.**  
*Organizations/Institutions  
(requires Board approval)*

☐

**International Members**  
**\$50.00 International**  
*All members outside U.S. &  
Canada regardless of category*

## Canadian Members

☐

**\$40.00 Professional**  
*Full-time Keepers*

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**\$35.00 Affiliate**  
*Other staff & volunteers*

☐

**\$35.00 Associate**  
*Those not connected with  
an animal facility*

☐

**\$60 or up - Individuals**  
**Contributing/Canada**

☐

**\$100.00 or up**  
**Institutional/Canada**  
*Organizations/Institutions  
(requires Board approval)*

☐

**Library Only**  
**\$35.00 Library**  
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& university libraries*

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Zoo Address \_\_\_\_\_

Title \_\_\_\_\_

Work Area \_\_\_\_\_

☐

**My check is enclosed (AAZK, Inc.)**

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**Please charge my credit card**

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Name on card \_\_\_\_\_ Expiration date \_\_\_\_\_

Signature \_\_\_\_\_

Mail this application to: AAZK Administrative Offices, Topeka Zoo, 635 S. W. Gage Blvd., Topeka, KS 66606-2066. Make checks/money orders payable to AAZK, Inc. Must be in U.S. FUNDS ONLY. Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.



**American Association  
of Zoo Keepers, Inc.  
635 S.W. Gage Blvd.  
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